UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FORTINET, INC.,

Petitioner,

v.

NETSKOPE, INC.,

Patent Owner.

PTAB Case No. IPR2026-00031

Patent No. 8,635,697

DECLARATION OF DR. MICHAEL FRANZ

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I. INTRODUCTION

1. I, Dr. Michael Franz, have been retained by Patent Owner Netskope, Inc. ("Patent Owner") to investigate and opine on certain issues relating to United States Patent No. 8,635,697 ("the '697 patent") in their response to the Petition submitted by Petitioner Fortinet, Inc. ("Petitioner") for *inter partes* review ("IPR").

2. The opinions set forth in this declaration are based on my personal knowledge, my professional judgment, and my analysis of the materials and information referenced in this declaration and its exhibits. In formulating my opinions, I have relied upon my knowledge, training, and experience in the relevant art. My qualifications are detailed more fully in my curriculum vitae, which is included as **Appendix A**. Below, I provide a brief summary of my qualifications.

3. I am being compensated for consulting services including time spent testifying at any hearing that may be held. I am also reimbursed for reasonable and customary expenses associated with my work in this case. I receive no other forms of compensation related to this case. My compensation does not depend on the outcome of this *inter partes* review or the co-pending district court litigation, and I have no other financial interest in this *inter partes* review.

4. This declaration is based on the information currently available to me. To the extent that additional information becomes available, I reserve the right to continue my investigation and study, which may include a review of documents and

information that may be produced, as well as testimony from depositions that have not yet been taken.

A. Qualifications

1. Education

5. I completed my undergraduate studies with a Diplomingenieur from the Swiss Federal Institute of Technology in Zurich ("ETH Zurich") in 1989. In 1994, I obtained my Doctorate of Technical Sciences from ETH Zurich. My dissertation was entitled "Code-Generation On-the-Fly: A Key to Portable Software."

2. Work Experience

6. I am a tenured Full Professor of Computer Science in the Donald Bren School of Information and Computer Sciences at the University of California, Irvine ("UCI"). I am also, by courtesy, a Full Professor of Electrical Engineering and Computer Science in the Henry Samueli School of Engineering at UCI. In 2016, the University awarded me the title of distinction of "Chancellor's Professor" and in 2022, I was further elevated to "Distinguished Professor," the highest campus-level title of distinction at my university.

7. In 2025, I was additionally appointed as an "ICS Alumni Professor." This endowed chair, which I hold concurrently with my other appointments, was donated by alumni of our school.

8. I have served as a visiting professor at ETH Zurich, the University of Klagenfurt in Austria, and the Technical University of Berlin, the Technical University of Brunswick, and the University of Ulm in Germany.

9. I have been elevated to Fellow of the Institute of Electrical and Electronics Engineers (IEEE), the global engineering society. Fellow is the highest of three grades of membership that are awarded based on merit. In every year, IEEE limits the number of new Fellows to one tenth of one percent of the membership, which currently stands at about 430,000 members.

10. I have also been elevated to Fellow of the Association for Computing Machinery (ACM), the global professional society for computer scientists. Fellow is the highest of ACM's four grades of membership. ACM's rules for Fellows are even more restrictive than IEEE's, limiting the total number of Fellows in absolute terms to 1% of the membership, which currently stands at about 100,000 members. In recent years, ACM has typically elevated no more than 50 individuals to Fellow status in a single year; in 2015, the year I was advanced, there were 42 new Fellows.

11. I have also been elevated to Fellow of the American Association for the Advancement of Science (AAAS), the world's largest general scientific society, with over 120,000 members.

12. Lastly, I am a member of the inaugural cohort of Fellows of the International Federation for Information Processing (IFIP), the global organization

for researchers and professionals working in the field of computing. Established in 1960 under the auspices of UNESCO, IFIP is recognized by the United Nations and links some 50 national and international societies and academies of science with a total membership of over half a million professionals. IFIP is an international, non-governmental organisation that operates on a non-profit basis.

13. In April of 2021, the Association for Computing Machinery (ACM) named me the recipient of the ACM Charles "Chuck" Thacker Breakthrough in Computing Award. This is the third highest award across all of computer science given by a professional society, behind only the Turing Award ("the Nobel Prize of Computing") and the ACM Prize in Computing (for early to mid-career contributions).

14. Furthermore, I am a recipient of the IEEE Computer Society's Technical Achievement Award. At most 5 of these awards are given annually by the IEEE Computer Society, the largest of the IEEE's technical societies with a current membership of more than 60,000 members.

15. Also, I am a recipient of the 2019 Humboldt Research Award, also known as the "Humboldt Prize." The award, given by the Alexander von Humboldt Foundation of Germany and funded by the German federal government, recognizes renowned researchers outside of Germany whose "fundamental discoveries, new theories or insights have had a significant impact on their own discipline and who

are expected to continue producing cutting-edge achievements in the future." It is the highest award given by the Foundation to researchers based outside of Germany.

16. In 2025, I was awarded an "ERC Advanced Grant" by the European Research Council, the highest research award given to individual researchers by the European Union.

17. I have led pioneering research on both the security and the performance aspects of downloadable code in client-server settings such as what we today call "Web 2.0." Two of my six awarded U.S. Patents concern themselves with security aspects of such programs downloaded over a network, one concerns itself with performance aspects of such code, while two further patents concern themselves with detecting and preventing malware attacks in general.

18. My research has had a real and lasting impact on a great many people. I am the co-inventor (with one of my former Ph.D. students) of the "Trace Tree" compilation technique, for which the United States Patent and Trademark Office has awarded U.S. Patent No. 8,769,511. I collaborated with the non-profit Mozilla Foundation to incorporate this technique into the Firefox web browser, where it became the basis of the "TraceMonkey" JavaScript engine, eventually used by several hundred million people every day.

19. Over the course of my career so far, I have been the Principal Investigator on several high-profile research projects with a total budget of well over

$24M. My expertise in software systems with distinct emphases on the security and performance of client-server and mobile computing has been sought out repeatedly by the Federal Government, and I have been participating in many high-level invitation-only meetings on Critical Infrastructure Protection and on Cyber Security organized by the National Intelligence Community, the Department of Defense, the Department of Homeland Security, and the Department of Energy. The overwhelming majority of the federally-funded projects that I have worked on over the course of my career have been related to computer security.

20. Before I recently reached the maximum allowed number of consecutive terms on the editorial board, I was an Associate Editor of one the flagship journals of the IEEE, the IEEE Transactions on Dependable and Secure Computing (TDSC). I have also served on the editorial boards of two further peer-reviewed scholarly journals focusing on software engineering, Software – Practice and Experience (SPE) and Computer Science – Research and Development (CSRD). I have served on the program committees of most major academic conferences that are related to the various themes of my research. I have served as the primary advisor to 40 completed Ph.Ds. and currently serve as the primary advisor on several further dissertations in progress.

3. Publications

21. In addition to my dissertation, I co-authored "Automated Software Diversity," released in 2015.

22. I have published 37 reviewed journal and magazine articles since 1993, and over 120 conference and workshop papers.

23. I am an inventor on six issued U.S. patents.

4. Curriculum Vitae

24. A copy of my curriculum vitae is attached as **Appendix A** to this declaration.

II. MATERIALS REVIEWED AND LEGAL STANDARDS

A. Materials Reviewed

25. I have been asked to review the Petition for IPR of Claims 1-25 of the '697 patent along with the associated patent (Ex. 1001), the prosecution history of the '697 patent (Ex. 1002), the alleged prior art relied on in Petitioner's invalidity grounds (Ex. 1004, Ex. 1005, Ex. 1006), the declaration of Petitioner's expert, Dr. Madesetti (Ex. 1003), and other associated exhibits and provide my opinions regarding the Petition and corresponding documents. I have considered these materials in their entirety, even if only portions are discussed here. The following is an exemplary list of materials on which I based my opinions.

Exhibit	Description
Ex. 1001	U.S. Patent No. 8,327,697 ("the '697 Patent")
Ex. 1002	File History of the '697 Patent
Ex. 1003	Declaration of Dr. Vijay Madesetti
Ex. 1004	U.S. Patent Publication No. 2008/0086773 ("Tuvell")
Ex. 1005	KR100765340B1 ("Lee")
Ex. 1006	U.S. Patent Publication No. 2010/0161795 ("Deridder")
Ex. 2011	U.S. Patent No. 9,104,871
Ex. 2012	U.S. Patent No. 9,009,818

26. I have also relied on my own experience and expertise in computer systems and computer systems security.

B. Priority Date of the Claims

27. I have been informed that a U.S. patent application may claim the benefit of the filing date of an earlier patent application if the earlier patent application disclosed each limitation of the invention claimed in the later-filed U.S. patent application. I have also been informed that priority is determined on a claim-by-claim basis so that certain claims of a patent may be entitled to the priority date of an earlier-filed patent application even if other claims of the same patent are not entitled to that priority date.

28. I have also been informed that a patented claim is invalid if the claimed invention was patented, described in a printed publication, or in public use, on sale,

or otherwise available to the public before the effective filing date of the claimed invention, or the claimed invention was described in an issued patent or a published patent application that was effectively filed before the effective filing date of the claimed invention.

29. I understand that the claims of the '697 patent claim a priority date of March 29, 2011.

C. Level of Ordinary Skill in the Art

30. I am not an attorney and offer no legal opinions. I have been informed about certain aspects of the law for purposes of my analyses and opinions.

31. I understand that in analyzing questions of invalidity and infringement, the perspective of a person having ordinary skill in the art ("POSITA") is often implicated, and the Court may need assistance in determining that level of skill.

32. I understand that the claims and written description of a patent must be understood from the perspective of a POSITA. I have been informed that the following factors may affect the level of skill of a POSITA: (1) the educational level of the inventor; (2) the type of problems encountered in the art; (3) the prior-art solutions to those problems; (4) the rapidity with which innovations are made; (5) the sophistication of the technology; and (6) the educational level of active workers in the field. A person of ordinary skill in the art is also a person of ordinary creativity in the art.

33. Petitioner proposes that a "POSITA, as of March 2011, would have been an individual with either (1) at least a bachelor's degree in computer science or computer engineering or an equivalent field plus at least one year of experience working on computer networking or security, or (2) at least 3 years of experience working on computer networking or computer security, even without a formal degree." Petition, 10-11; Ex. 1003, ¶16.

34. For the purposes of this declaration, I have relied on the definition of a POSITA proposed by Petitioner to evaluate Petitioner's positions. I reserve the right to propose a different definition of a POSITA at a later stage of the proceeding.

35. As shown by my qualifications and my curriculum vitae attached as **Appendix A**, I was at least a person of ordinary skill in the art at the time of the priority date of the '697 patent, and I am aware of the knowledge and skill possessed by a person of ordinary skill in the art at the time of the priority date of the '697 patent. In performing my analysis, I have applied the standard set forth above.

D. Standards for Invalidity

1. Anticipation

36. I am informed and understand that a prior art reference anticipates a claim of a patent if each and every element of the claim is found either explicitly or inherently in a single prior art reference or system. I understand that inherency requires a showing that the missing descriptive matter in the claim is necessarily or

implicitly present in the allegedly anticipating reference, and that a POSITA would have so recognized it. In addition, I understand that an enabling disclosure is a disclosure that allows a POSITA to make the invention without undue experimentation.

2. Obviousness

37. I am informed and understand that a patent cannot be properly granted for subject matter that would have been obvious to a person of ordinary skill in the art at the time of the alleged invention, and that a patent claim directed to such obvious subject matter is invalid under 35 U.S.C. § 103. It is also my understanding that in assessing the obviousness of claimed subject matter, one should evaluate obviousness in light of the prior art from the perspective of a person having ordinary skill in the art at the time the alleged invention was made (and not from the perspective of either a layman or a genius in that art). It is my further understanding that the question of obviousness is to be determined based on:

- The scope and content of the prior art;
- The difference or differences between the subject matter of the claim and the prior art (whereby in assessing the possibility of obviousness one should consider the manner in which a patentee and/or a Court has construed the scope of a claim);
- The level of ordinary skill in the art at the time of the alleged invention of the subject matter of the claim; and

- Any relevant objective factors (the "secondary indicia") indicating nonobviousness, including evidence of any of the following: commercial success of the products or methods covered by the patent claims; a long-felt need for the alleged invention; failed attempts by others to make the alleged invention; copying of the alleged invention by others in the field; unexpected results achieved by the alleged invention; praise of the alleged invention by the alleged infringer or others in the field; the taking of licenses under the patent by others and the nature of those licenses; expressions of surprise by experts and those skilled in the art at the subject matter of the claim; and whether the patentee proceeded contrary to accepted wisdom of the prior art.

- Any relevant objective factors (the "secondary indicia") indicating obviousness: independent invention of the claimed invention by others before or at about the same time as the named inventor thought of it; and other evidence tending to show obviousness.

E. Claim Construction

38. I am informed and understand that claim terms generally are construed in accordance with the plain, ordinary and customary meaning they would have to a POSITA at the time of the invention in light of the claim language, the specification, and the prosecution history. I understand that dictionaries and other extrinsic evidence may be considered as well, though such evidence is typically regarded as less significant than the intrinsic record in determining the meaning of the claim language.

39. For the purposes of this declaration, I have interpreted all of claims and their terms under their plain an ordinary meaning. I reserve the right to propose a specific construction for any claim or claim term at a later stage of the proceeding.

40. For all terms of the challenged claims of the '697 patent, I have interpreted them as they would have been understood by a POSITA at the time of the invention, *i.e.*, in 2011.

III. OVERVIEW OF THE'697 PATENT

41. The '697 Patent is set in the context of network-based malware detection in a service provider network. Ex. 1001, Abstract. As Figure 1 (below) shows, the computers (104, 106, 108) that are being monitored by the network-based malware detection service are at a user location (100) behind a network address translation (NAT) gateway/access device (102). The network-based malware detection service examines network packets traveling from the user location's NAT gateway (102) to a destination (122) coupled to the service provider network (110). From the perspective of the network-based malware detection service, all the packets from all the devices at the user location (100) behind the NAT gateway (102) come from the same network address. *See id.*, 4:10-5:18.

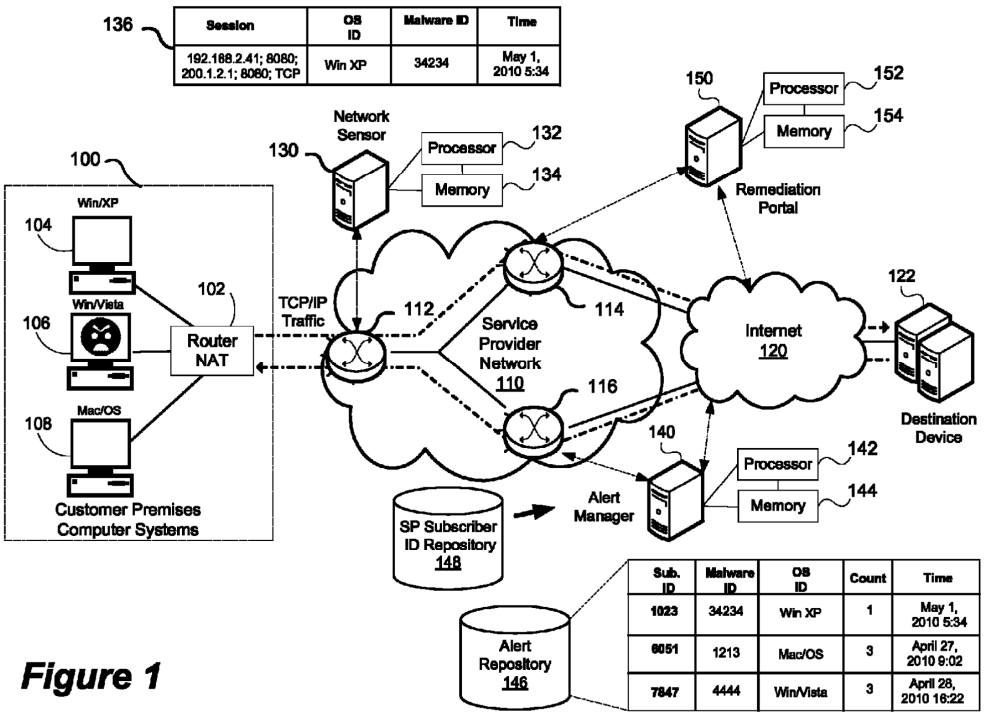

Figure 1

42. Hence, when the network-based malware detection service detects malware signatures in the network traffic, network addresses alone are not sufficient to identify the specific device(s) that triggered the malware detection match. The '697 patent teaches a way by which the network-based malware detection service can provide malware alerts (136) discriminated by the operating system to which the alert applies. This makes it possible at the user location on the other side of the NAT gateway to focus remediation on devices that might be infected and not waste resources on devices that are running an entirely different operating system than the one that was detected during the malware signature match. *See id.*, 3:57-4:9, 5:20-6:51.

43. Consistent with this description, the independent claims of the ’697 patent are directed to operations that include detecting the malware based on monitoring (receiving) network TCP packets originating from the access device, determining an operating system identifier associated with the TCP session, and ***generating specific alerts*** that identify not only the network address of the access device and the ID of the malware that was detected, but also identifying an operating system associated with the network traffic that triggered the malware signature detection.

44. I have analyzed Petitioner’s expert declaration, and I have to note that Petitioner’s expert, Dr. Madisetti, appears to oversimply the ‘697 patent as “detecting computers within a network that have been compromised by malware.” Ex. 1003, ¶65. This over-simplification ignores the remaining description of the ’697 patent and the fact that when devices that have been compromised are behind a NAT gateway, a network-based malware detection service cannot generally pinpoint exactly which of these devices have been compromised. The point of the ’697 patent is not the detection *per se*, but enabling the organization that operates the devices behind the NAT gateway to reduce the effort required to remove an infection, by enabling it to focus its remediation effort on a subset of devices running a particular operating system. The actual “detection of computers that have been compromised” doesn’t happen in the network-based malware detection service in

the service provider network, but is performed by the devices' operator on the other side of the NAT gateway. The '697 patent teaches an innovative way for the network-based service to provide alerts that can then be used, on the other side of the NAT gateway, to narrow down the identification of infected device(s).

IV. SUMMARY OF OPINIONS

45. I have reviewed and analyzed the '697 patent.

46. Based on my review and analysis, it is my opinion that claims 1-25 of the '697 patent are patentable over the references cited in the following grounds of the Petition.

Ground	Basis	Reference(s)	Challenged Claims
1	§ 103	Deridder combined with Tuvell and Lee	1-25

47. It is my opinion that the combination of Deridder, Tuvell and Lee fails to render obvious independent claims 1, 15 and 24 obvious, and therefore this combination necessarily fails to render obvious the remaining dependent claims of the '697 patent. I provide further details below.

V. THE COMBINATION OF DERIDDER, TUVELL AND LEE FAIL TO RENDER CLAIMS OF '697 PATENT OBVIOUS

A. Overview of Deridder

48. Deridder describes "methods and devices for identifying and tracking multiple computer user sessions associated with a network address translation

(NAT) device coupled to a computer network." Ex. 1006, Abstract. Deridder provides a diagram in its Figure 1 that has some similar components as Figure 1 of the '697 patent. But the similarities mainly relate to the depictions of user devices (102, 104, 106) behind a router/NAT 102 that communicates with a service provider network. *See id.*, Figure 1. Reading the contents of the Deridder reference reveals that aside from superficial similarities in Figure 1, Deridder's patent differs significantly from the invention of the '697 patent.

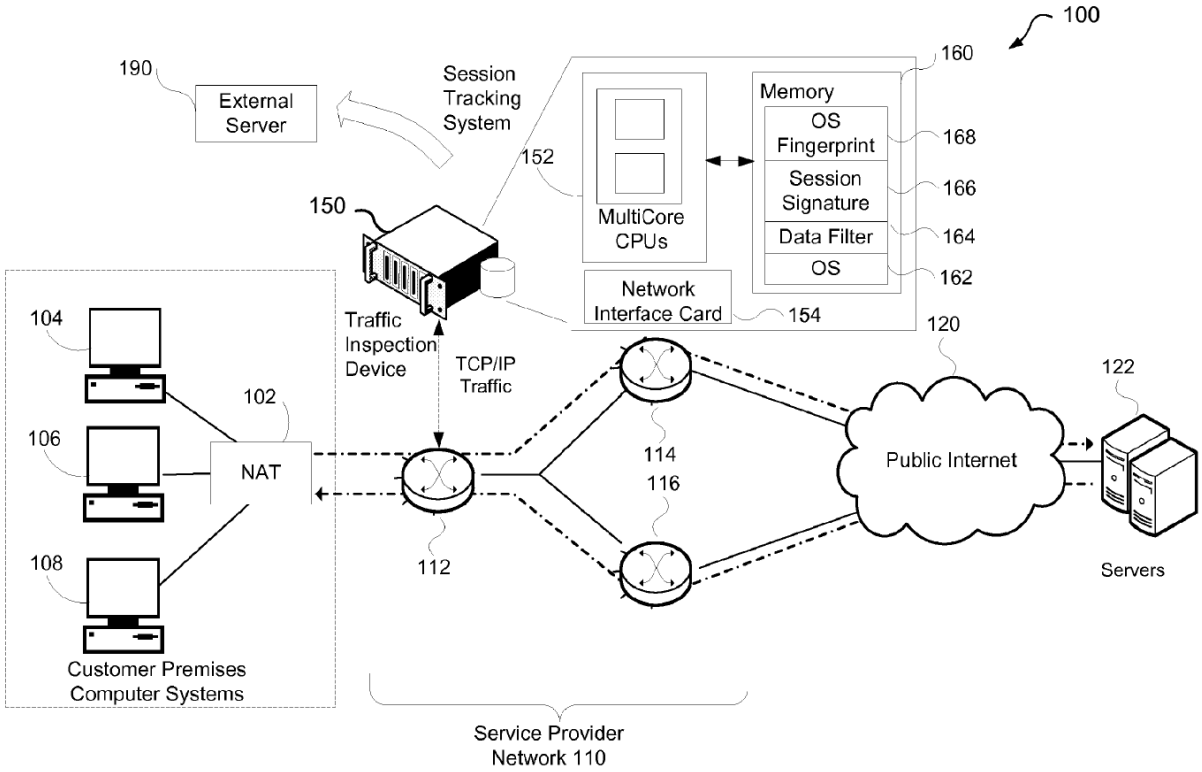

Figure 1

49. Critically, Deridder is not about remediation or even about malware – ***Deridder mentions the term "malware" only once*** in paragraph [0022], when describing <u>a network interface card 154</u> which "provides an interface to the Service

Provider Network 110 for receiving packets for processing and enables communication with external servers 190 which provide services for utilizing the session tracking functionality for services such as network monitoring, targeted advertising, *malware detection*, etc." Deridder contains no references to malware or synonyms such as "virus" other than in the description of network card 154 that I have cited above in its entirety.

B. Overview of Tuvell

50. Tuvell describes a system for reporting and visualizing malware on mobile networks. Ex. 1004, Abstract. In this approach, as shown in Figure 3 (below), a client malware scanner (310) is present on mobile devices in a mobile network (302). *See id*., ¶45.

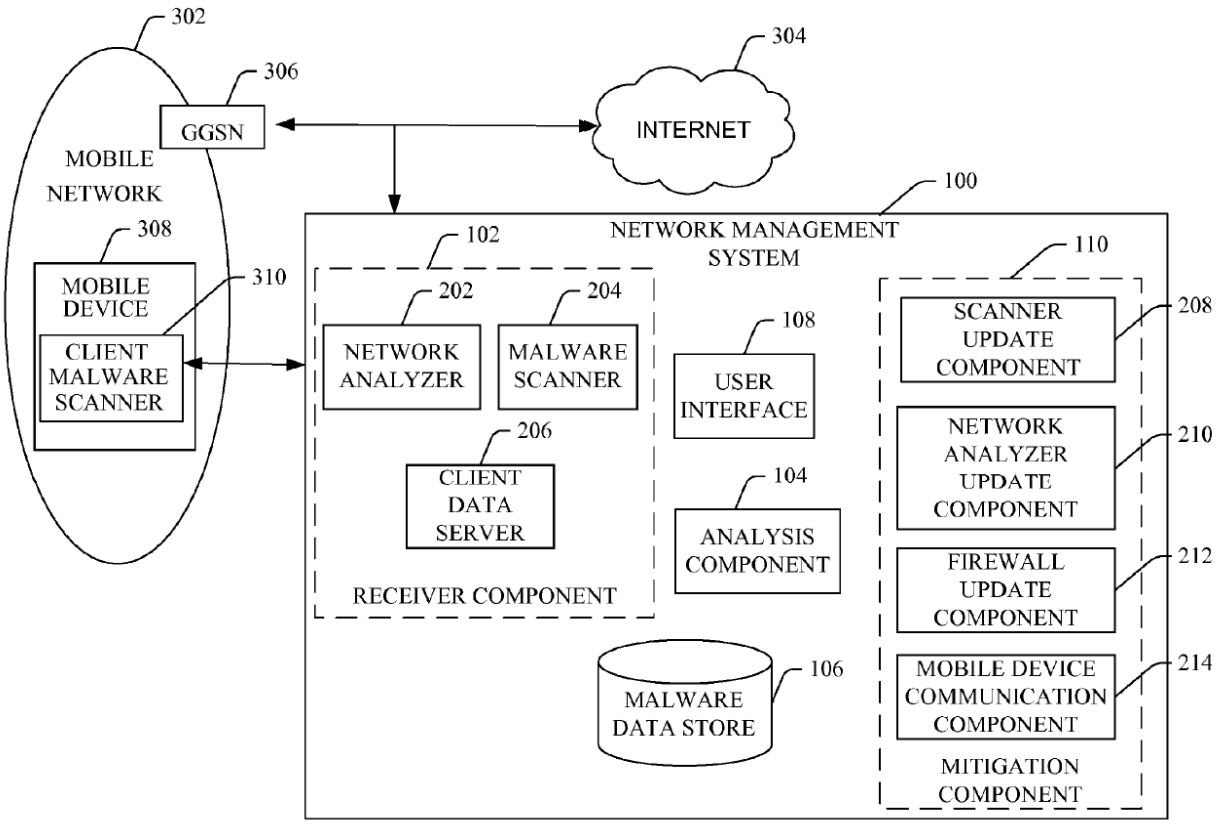

FIG. 3

51. An analysis component (104) generates a malware analysis of the mobile network using data received from multiple sources. *Id.*, ¶37. In certain embodiments as described in paragraph [0035], a client data server receives reports of viruses or other malware from one or more client mobile devices. *Id.*, ¶35. Individual mobile devices utilize scanning software to determine when malware is present and transmit malware or infection reports to the mobile network. In certain embodiments, the system may then be able to identify the mobile device that transmitted an infected packet or packets by correlating information collected in the network with information collected on client devices directly. *Id.*, ¶36.

52. The teaching in Tuvell is in stark contrast to the '697 Patent, which teaches and claims a technique that is executed entirely on the service provider network side to provide alerts. These alerts then enable operators at a user location, on the other side of a NAT device, to provide more efficient remediation. Conversely, Tuvell's technique has components executing on both sides of address translation, including "scanning software" executing on the end user devices themselves. *See id.*, ¶¶45, 48-49. These are very different systems for very different purposes.

53. I also note that Tuvell does not describe "determining" the operating system of a mobile device.

C. Overview of Lee

54. Lee describes a technique for substituting physical in-line network security methods by virtual ones. Ex. 1005, ¶¶13, 26, 35. As Lee explains, a problem with physical in-line network security equipment is that it slows down traffic, and that security equipment failure can lead to network disconnection. See e.g., *id.*, ¶¶19, 24. In the virtual in-line network security method, different in-line functions are mapped onto different processes that operate on network packets in sequence. Id. ¶30.

55. Lee provides a passing reference to "estimating (Guessing) [sic] the operating system (OS) of the extracted node" in its paragraph 48 and Table 1 (*id.*,

¶48), but provides no explanations about how the "Guessing" of OS is carried out. Also, the very poor translation quality of the Lee reference makes it difficult to follow its description, but Lee appears to describe that the OS information, along with the origin address, MAC address and other system conditions, are used to determine whether a system is "subject to a virtual path." *Id*., ¶41. This use of the OS information as one factor to determine whether a system should be subject to Lee's virtual path is completely irrelevant to the subject matter and claims of the '697 patent.

D. A POSITA would not have found it obvious to combine Deridder with Tevell and Lee

56. In my opinion, the combination of Deridder, Tuvell and Lee offered by Petitioner does not make any sense and a POSITA would not have any motivation for this combination, other than based on hindsight. First, none of the references offered by themselves show the claimed invention of the '697 patent. The Deridder, Tuvell and Lee references each have an entirely different focus than the '697 patent and are also different from each other, as I have explained above. A POSITA would be very unlikely to even consider these references next to each other, and would not know how to combine them.

57. In particular, Tuvell's approach combines client-side information with provider network-side information. The use and generation of the client-side malware detection is explicitly explained in Tuvell's paragraph 45, where the client-

side malware scanner 310 (see Figure 3 below) detects malware on mobile client devices 308 inside the mobile network 302, and if malware is detected, the client-side malware scanner 310 then generates an infection report 404 that provides malware data to the receiver component 102 on the network side. As Tuvell explains, "the infection report 404 can include mobile device 308 information, such as the identification of the mobile phone (e.g., phone number), firmware of the particular mobile device 308 (e.g., operating system information) and the software version of the mobile device 308." Tuvell at 49.

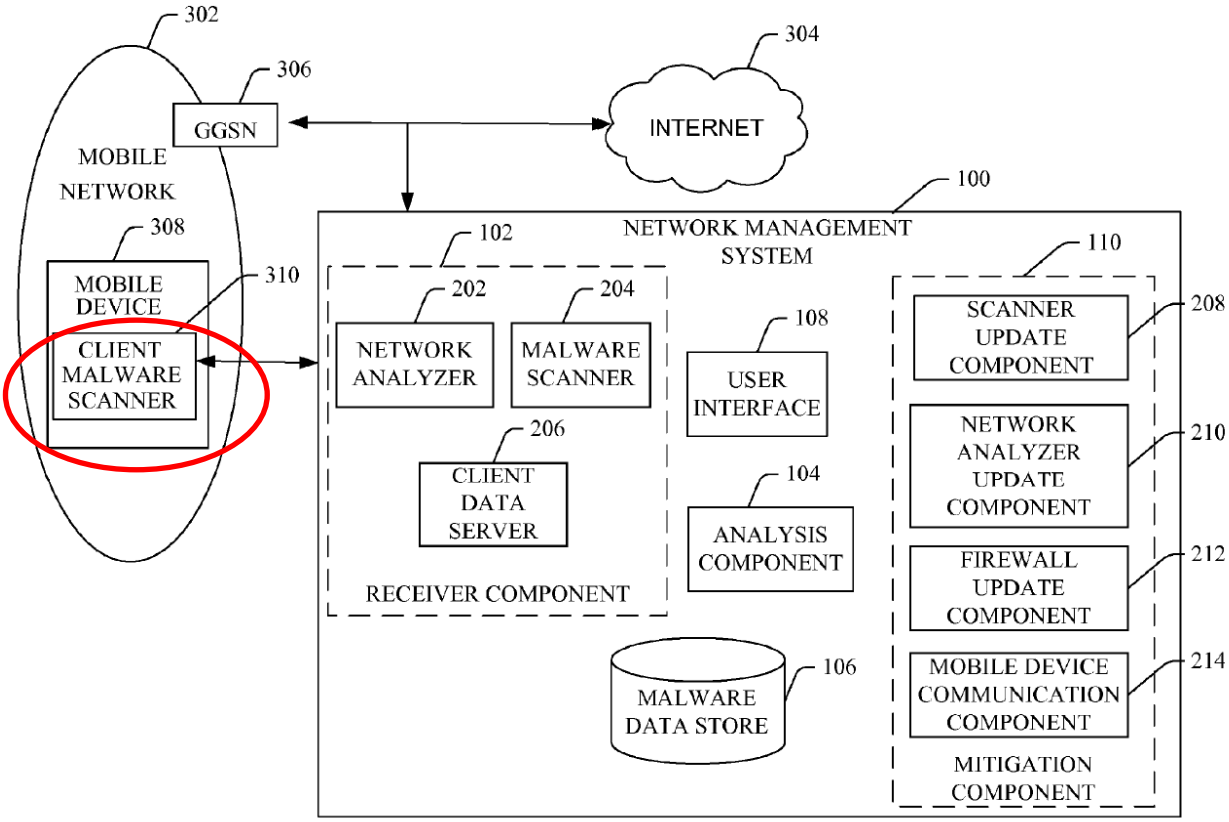

FIG. 3

58. Tuvell is contradictory to the point of the ’697 Patent and its claims, where the malware detection and malware scanning are performed on the provider network side, where one cannot precisely distinguish between the individual user devices on the user side of the NAT gateway. Critically, a POSITA would have clearly understood that if you already have client-side scanning and you might even be able to pinpoint an infected device down to a specific phone number, as in Tuvell, you don’t need any of the mechanisms taught in the ’697 patent, which are meant to reduce the remediation effort on the user side of the NAT gateway after malware has been detected. There would have been no reason for a POSITA to combine anything with Tuvell in this context. In other words, a POSITA would have recognized that Tuvell is a stand-alone solution that can identify specific client devices that are infected by malware since it is able to perform the malware scanning on these very devices themselves. Hence, a POSITA in possession of Tuvell with the objective of (quoting Dr. Madisetti) “detecting computers that have been compromised” wouldn’t need to look any further; they would have adapted Tuvell’s malware scanning from running on mobile devices to running on computers and would have accomplished their desired objective right then and there.

59. Furthermore, as I explained above, Deridder does not provide any details whatsoever about malware scanning or malware detection. Therefore, a POSITA in possession of Deridder and Tuvell, if contemplating such a combination,

would have only contemplated implementing the entire malware detection and scanning solution of Tuvell in Deridder. But the malware detection and the entire objective of Tuvell is significantly different from the claims of the '697 patent – due at least in part to its reliance on the client-side malware scanning and the fact that it can pinpoint infected devices precisely, such as by their phone number. Therefore, any attempt by Petitioner to propose a contrived combination would have been a far-fetched and unreasonable combination and it would not have even rendered the claims of the '697 patent obvious.

60. Regarding Lee, Petitioner appears to be using this reference only for its explanations about estimating or guessing the Operating System information. But as I have explained above, there are no explanations in Lee about how the OS information is guessed (or estimated), and Lee's use of the OS information is confined to determining whether a system should be subject to a virtual path. Ex. 1005, ¶41. There is nothing in Lee that would motivate, inform or even provide any reasons for a POSITA to use Lee in combination with Deridder and Tuvell.

61. Hence, the Petitioner is essentially finding disparate information about OS identification, malware scanning and alert generation that doesn't fit together in any coherent way, nor actually describes the claimed invention. In my opinion, a POSITA would not have found this combination obvious in any way.

E. The combination does not teach or suggest 1[b]'s "determining an operating system identifier (OS ID) associated with the TCP session and the computing device"

62. Petitioner uses a combination of Deridder and Tuvell for element 1[b] (and similar elements in independent claims 15 and 21). Petitioner starts by arguing that Deridder describes generating an OS fingerprint based on Derider's explanation in paragraph [0031] that mentions a passive fingerprinting tool called "p0f." Petition, 25-26, Ex. 1003, ¶98. But that same section of Deridder actually contradicts Petitioner's position, because it explicitly states that Deridder does not use the p0f tool to determine a specific OS. I have reproduced the relevant section of Deridder's paragraph [0022] below.

> However, unlike p0f, ***the present system does not try to match the fingerprint to a list of known OS fingerprints***, because it is concerned less with the characterization of computer systems and more with the detection and tracking of unique sessions.

63. In my opinion, a POSITA, reading the above description of Deridder would not have been motivated, nor found it obvious, to try to match the fingerprint to a known OS fingerprint. Petitioner's hypothetical combination would require the POSITA to ignore, and in fact act in direct opposition to Deridder's explicit teaching that "matching the fingerprint to a list of known OS fingerprints" is not necessary for the system described by Deridder. Neither Derider, nor Tuvell, nor Lee

recognize the problem that is addressed by the '697 patent to enable efficient OS-specific malware remediation to user devices that are behind a NAT, and thus a POSITA would not have contemplated to obtain an OS-specific identification in a manner that expressly contradicted the description of Deridder.

64. Petitioner further proposes combining Tuvell with Deridder for element 1[b]. Petition, 27, Ex. 1003, ¶98. In Petitioner's narrative, a POSITA would start with Deridder and would supposedly find it obvious not only "to add malware detection to the service provider's network" but also to "use the OS fingerprinting in Deridder based on Deridder's explicit recognition of this." Petition, 17, 27; Ex. 1003, ¶¶85-86, 98. But Deridder doesn't mention malware remediation, and only mentions malware detection in passing in connection with a "network connection card." Ex. 1006, ¶22. In my opinion, expecting a POSITA to take the leap, from a single mention of the term "malware detection" in the description of a hardware component, to using an operating system ID in a malware alert to reduce the workload of malware remediation, is absurdly far-fetched for the reasons that I explained earlier about why a POSITA would not have found such a combination obvious.

65. Petitioner also mentions Lee in the context of element 1[b]. Petition, 28; Ex. 1003, ¶98. But, as I have explained earlier and the Petition seems to admit (Petition, 28), Petitioner does not explain how the OS information is obtained in Lee.

Lee only mentions guessing (estimating) the OS information, and it uses the OS information as one of several factors when determining whether a system is "subject to a virtual path." Ex. 1005, ¶41. But there is nothing in Lee that would motivate or inform a POSITA, or make it obvious in any way, to combine Lee with Deridder and Tuvell to perform element 1[b] or any of the operations in claim 1 of the '697 patent.

66. Additionally, as I explained earlier, Tuvell's system relies on client-side malware detection, where one could trivially obtain the characteristics and indeed even the specific identity of the device on which the client malware scanner runs. As Tuvell explains, such information might include not only "type of mobile device 308, operating system, software and versions, and user information and mobile device 308 identifier," but an infection report 404 might also contain "product identification that identifies the client malware scanner 310 software." In addition, the infection report 404 might include even more specific information, "such as the identification of the mobile phone (e.g., phone number)." (Ex. 1004, ¶49). I do not agree that a POSITA would have found it obvious to combine Deridder and Lee.

F. The combination does not teach or suggest 1[c]'s "determining if malware is present in the TCP session and an associated malware ID by comparing a malware signature to the one or more TCP packets"

67. Petitioner appears to rely only on Deridder for element 1[c] (and similar elements in independent claims 15 and 21). Petition, 28-29, Ex. 1003, ¶99. Petitioner proposes that element 1[c] would be obvious based on Tuvell's description of "malware signature searches [and] hash signature searches." Ex. 1004, ¶35. But unlike in element 1[c] where a malware signature is compared to "one or more TCP packets," paragraph [0035] of Tuvell is describing performing a signature search or hash search of the software executing on the client mobile devices. I have copied the relevant sections of Tuvell's paragraph [0035] below.

> In a further embodiment, the receiver component 102 includes a client data server 206 ***that receives reports of viruses or other malware from one or more client mobile devices***. ***<u>Individual mobile devices utilize scanning software to determine when malware is present and transmit malware or infection reports to the mobile network.</u>*** Some representative *malware scanning algorithms* for mobile devices include, but are not limited to, *malware signature searches; hash signature searches* as described in U.S. patent application Ser. No. 11/697,647 "Malware Detection System and Method for Mobile Platforms"; malware detection in headers and compressed parts of mobile messages as described in U.S. patent application Ser. No. 11/697,658 "Malware Detection System and Method for Compressed Data on Mobile Platforms ….

68. A POSITA would have understood that device-based "malware scanning algorithms" for mobile devices at the time of Tuvell would have focused primarily on examining the executable code on the mobile device to detect malicious programs prior to executing them. In fact, for the term "hash signature searches" Tuvell itself cites to U.S. patent application Ser. No 11/697,647 "Malware Detection System and Method for Mobile Platforms." *See* Ex. 1004, ¶35. This patent application issued as U.S. Patent No. 9,104,871 (Ex. 2011) and describes a method, system, and medium for examining the code of an application for malware. This specific reference cited by Tuvell does not at all relate to scanning IP packets, but to scanning the software present on the mobile device to prevent the execution of malware that may already have been introduced to the device. Ex. 2011, Abstract, 5:63-6:55. Tuvell also mentions "malware detection in headers and compressed parts of mobile messages" and cites U.S. patent application Ser. No 11/697,658 "Malware Detection System and Method for Compressed Data on Mobile Platforms." *See* Ex. 1004, ¶35. This reference, issued as U.S. Patent No. 9,009,818 (Ex. 2012), describes a system for searching compressed mobile data to discover specific search strings that correspond to byte sequences in known malicious executables. *Id*., Abstract.

69. This is in stark contrast to element 1[c] (and the '697 patent). Claim 1 is directed to a "method of network based malware detection in a service provider

network" and all the elements of Claim 1, including "determining if malware is present […] by comparing a malware signature to the one or more TCP packets" are all performed on the provider network side of the NAT gateway.

70. Quite clearly, Tuvell relies on client-side malware detection, which is not what element 1[c] requires, and is not what the '697 patent is about. In my opinion, the Petitioner has not shown that it would be obvious to a POSITA to make arbitrary changes to how and where Tuvell conducts its malware detection, which would have had the effect of fundamentally changing the architecture, the methodologies and the objectives of Tuvell.

G. The combination does not teach or suggest 1[d]'s "generating an alert identifying a network address associated with the access device, the malware ID and the OS ID associated with TCP session that generated the alert"

71. None of Deridder, Tuvell or Lee describe generating the specific alert that is recited in element 1[d] (and similar elements in claims 15 and 24). The Petition starts by purporting that Tuvell describes generating "a" report or alert, and then repeatedly invokes how it would have been obvious to a POSITA that Tuvell's report would include the multiple required elements of the report that are listed in element 1[c]. Petition, 29-30, Ex. 1003, ¶100.

72. As I explained above, in my opinion it would not have been obvious to combine Deridder, Tuvell and Lee. Therefore, any hypothetical report that would be generated based on such a combination would not be obvious. More specifically,

in Tuvell's system, each client-side mobile device already provides a malware report and detailed information about each specific mobile device, including its operating system, the type of device, "software and versions," user information, and indeed even "mobile device 308 information, such as the identification of the mobile phone (e.g., phone number) […] ". Ex. 1004, ¶49. If you already have a way of identifying, client-side, the one specific device that generated the malware report in the first place, you do not need the mechanism taught in the '697 patent for "network based malware detection in a service provider network."

73. In Tuvell, it is the client malware scanner 310 inside of individual mobile devices that generates such infection reports 404 that are delivered to the core system – not the network agent (or CoreStats). *Id.*, ¶48. Petitioner's combination requires generating the claimed reports based on a fundamental architectural change in Tuvell's malware detection scheme. This is neither obvious, nor straightforward, and certainly not obvious to a POSITA.

VI. CONCLUSION

74. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001; and further that such willful false statements may jeopardize the validity of the application or any patent issued thereon. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on 1/13/2026.

DR. MICHAEL FRANZ

APPENDIX A

Michael Franz

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Major Research Emphases

- Secure and trustworthy computing. Critical cyber-infrastructure protection. Software security. Computer systems security. Language-based security. Information flow. System-level end-to-end security properties. Moving target defenses, automatically generated software diversity, n-variant systems.
- Software execution environments. Compilers, virtual machines, and machine code generation and optimization. On-the-fly, feedback-directed and continuous compilation and optimization; binary translation; trace-based compilation. Code generation for embedded systems, heterogeneous architectures, and mobile computing; compiling for low power consumption. Automatic parallelization. Memory management.
- Software Engineering. Software architectures for secure systems; minimizing the trusted code base. Software reliability and robustness. Software performance estimation.

Education

Doctor of Technical Sciences, ETH Zürich, Switzerland; February 1994
Dissertation Title: "Code-Generation On-the-Fly: A Key to Portable Software"
Advisor: Niklaus Wirth

Diplomingenieur, ETH Zürich; May 1989

Academic Appointments

2025 – present	***Distinguished Professor and ICS Alumni Professor***
2022 – 2025	***Distinguished Professor***
2016 – 2022	***Chancellor's Professor***
2006 – present	*Professor of Computer Science* (with tenure)
2001 – 2006	*Associate Professor* (with tenure)
1996 – 2001	*Assistant Professor* Department of Computer Science (since January 2003) Department of Information and Computer Science (until January 2003) **The Donald Bren School of Information & Computer Sciences** University of California, Irvine
2007 – present	*Professor of Electrical Engineering & Computer Science* (by courtesy) Department of Electrical Engineering & Computer Science **The Henry Samueli School of Engineering** University of California, Irvine
1994 – 1995	*Senior Research Associate ("Oberassistent") and Lecturer* Institut für Computersysteme ETH Zürich, Switzerland

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Visiting Appointments

April – July 2025	*Visiting Researcher* (on sabbatical from UC Irvine) Technical University of Berlin, Germany (Host: Prof. Dr. Jean-Pierre Seifert)
April – December 2023	*Visiting Researcher* (on sabbatical from UC Irvine) Technical University of Berlin, Germany (Host: Prof. Dr. Jean-Pierre Seifert)
June 2019 – June 2022	*Guest Professor* (partially on sabbatical from UC Irvine) Technical University of Braunschweig, Germany (Host: Prof. Dr. Ina Schäfer)
June – December 2019	*Visiting Researcher* (on sabbatical from UC Irvine) Technical University of Berlin, Germany (Host: Prof. Dr. Jean-Pierre Seifert)
August 2010 – September 2011	*Visiting Professor* (on sabbatical from UC Irvine) ETH Zurich, Switzerland (Host: Prof. Dr. Thomas Gross)
January – September 2002	*Visiting Researcher* (on sabbatical from UC Irvine) University of California, Berkeley (Host: Prof. Dr. George Necula)
Summer Semester 2000	*Visiting Professor* University of Klagenfurt, Austria (Host: Prof. Dr. Laszlo Böszörményi)
Summer Semester 1998	*Visiting Professor* University of Ulm, Germany (Host: Prof. Dr. Peter Schulthess)

Major Professional Honors

- I have been awarded an *European Research Council (ERC) Advanced Grant (ADG)* of €2.5 Million, a lump-sum grant for a five year period starting 1st July 2026. ERC ADGs are "awarded to exceptional leaders in terms of originality and significance of their research contributions" and "give senior researchers the opportunity to pursue ambitious, curiosity-driven projects that could lead to major scientific breakthroughs;" 2025.

- *ACM Charles P. "Chuck" Thacker Breakthrough in Computing Award, Association for Computing Machinery (ACM),* "for the development of just-in-time compilation techniques that enabled fast and feature-rich web services on the internet." This personal award of $100,000 recognizes "individuals who have made a surprising or disruptive leapfrog in computing ideas or technologies;" 2020.

- *Fellow, American Association for the Advancement of Science (AAAS),* "for distinguished contributions to computer science, particularly to the areas of just-in-time compilation and optimization and techniques for computer security;" 2019.

- *Inaugural Fellow, International Federation for Information Processing (IFIP).* The Fellow Award recognizes individuals of the highest professional standing and expertise in one of IFIP's constituent societies (which includes ACM) who have also contributed directly to IFIP. Established in 1960 under the auspices of UNESCO, IFIP is the global organisation for researchers and professionals working in the field of information and communication technologies. IFIP is recognised by the United Nations and links some 50 national and international societies and academies of science with a total membership of over half a million professionals. 2019.

- *Humboldt Research Award*, Alexander von Humboldt Foundation. This personal award of €60,000 is granted in recognition of a researcher's entire achievements to date to academics whose fundamental discoveries, new theories, or insights have had a significant impact on their own discipline and who are expected to continue producing cutting-edge achievements in the future; 2018.

- *Fellow, Association for Computing Machinery (ACM),* "for contributions to just-in-time compilation and optimization and to compiler techniques for computer security;" 2015.

- *Fellow, The Institute of Electrical and Electronics Engineers (IEEE),* "for contributions to just-in-time compilation and to computer security through compiler-generated software diversity;" 2015.

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- *IEEE Computer Society Technical Achievement Award,* 2012, "for pioneering contributions to just-in-time compilation and optimization and significantly advancing Web application technology."
- *University of California, Irvine, Distinguished Mid-Career Faculty Award for Research*, 2010. This is the Academic Senate's highest honor for research. One such award at most is given yearly to an Assistant Professor, one to an Associate or Full Professor Step I-IV (the "Mid-Career Award"), and one to a Professor Step V or higher.
- *National Science Foundation CAREER Award*, 1997.
- *Fulbright Scholarship*, 1989.

Teaching Honors

- *Dean's Award for Graduate Student Mentoring*, Donald Bren School of Information and Computer Sciences, UC Irvine, awarded three times in 2007, 2016, and 2022.
- *Outstanding Professor of the Year Award*, Graduating Class of 2007, UC Irvine.

Institutional Affiliations

- Director, *Secure Systems and Software Laboratory,* Donald Bren School of Information and Computer Sciences, UC Irvine; since September 2007.
- Charter Faculty Member, *The California Institute for Telecommunications and Information Technology (Cal-(IT)^2),* one of four California Institutes for Science and Technology.
- Charter Faculty Member, *Security Computing and Networking Center (SCoNCe)* (previously named *Center for Cyber-Security and Privacy*), Donald Bren School of Information and Computer Sciences, UC Irvine.

Noteworthy Contributions With Wide Impact

I am the co-inventor (with my former Ph.D. student Andreas Gal) of the "Trace Tree" compilation technique, which has been transitioned successfully from academic research into one of the most widely distributed open-source projects. From version 3.5 (June 2009) onwards, the JavaScript engine in *Mozilla's Firefox* browser has been based directly on my academic research (see publication C.58).

Furthermore, since version 4.0 (March 2011), the *Firefox* browser additionally contains the "Compartmental Memory Manager" developed in collaboration between my lab and Mozilla (see publication C.69). No fewer than four of my former students with completed Ph.D.s are now employed full-time at Mozilla.

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Research Funding

Current Grants and Awards

- *DARPA I2O Small Business Technology Transfer (STTR) Program,* 140D04-23-C-0070, "Robust Sandboxing and Lifting of ELF Binaries—Sequential Phase II," 1st October 2023 – 14th March 2026, $404,958 (**sole PI** on sub-award from prime contractor Immunant, Inc.). PMs Dr. Sergey Bratus / Dr. Daniel Wallach.

Past Grants and Awards

- *DARPA,* 140D04-23-C-0063, "Patches Assured up to Trace Equivalence (PATE) Transition," 14th August 2023 – 7th April 2025, $585,964 (**sole PI** on sub-award from prime contractor Galois, Inc. / Ben Davis). PMs Dr. Sergey Bratus / Dr. Daniel Wallach.
- *DARPA I2O Small Business Technology Transfer (STTR) Program,* W31P4Q-20-C-0052, "IA2: Intent-Capturing Annotations for Isolation and Assurance—Phase II Option," 15th July 2023 – 14th July 2024, $152,716 (**sole PI** on sub-award from prime contractor Immunant, Inc.). PMs Dr. Sergey Bratus / Dr. Daniel Wallach.
- *Office of Naval Research,* N00014-21-1-2409, "HONEY-MON: Combining Survivability with Cyber Deception;" 1st May 2021 – 30th April 2024, $998,870 (**sole PI**). PM Dr. Daniel Koller.
- *Office of Naval Research,* N00014-22-1-2232, "Attack Surface Reduction for Binary Programs BinRec Transition;" 1st March 2022 – 30th September 2023, $200,000 (**sole PI**. PMs Dr. Samuel M. Weber / Dr. Ryan Craven.
- *DARPA I2O Small Business Technology Transfer (STTR) Program,* W31P4Q-20-C-0052, "IA2: Intent-Capturing Annotations for Isolation and Assurance—Phase II," 15th July 2021 – 14th July 2023, $306,075 (**sole PI** on sub-award from prime contractor Immunant, Inc.). PM Dr. Sergey Bratus.
- *DARPA, Assured Micropatching (AMP) Program,* N66001-20-C-4027, "Patches Assured up to Trace Equivalence (PATE)," 15th July 2020 – 14th January 2022, $897,378 (**sole PI** on sub-award from prime contractor Galois, Inc. / Tristan Ravitch). PM Dr. Sergey Bratus.
- *Office of Naval Research,* N00014-17-1-2782, "Attack Surface Reduction for Binary Programs;" 30th September 2017 – 30th September 2021, $3,157,799 (**lead PI**. This is a collaborative award with Herbert Bos of Vrije Universiteit Amsterdam, Netherlands. My share of the award is $2,337,935). PM Dr. Sukarno Mertoguno.
- *DARPA I2O Small Business Technology Transfer (STTR) Program,* W31P4Q-20-C-0052, "IA2: Intent-Capturing Annotations for Isolation and Assurance—Phase I," 1st September 2020 – 31st March 2021, $67,500 (**sole PI** on sub-award from prime contractor Immunant, Inc.). PM Dr. Sergey Bratus.
- *National Science Foundation, Secure & Trustworthy Cyberspace (SaTC) Program,* CNS-1619211, "TWC:Small: Hydra—Hybrid Defenses for Resilient Applications: Practical Approaches Towards Defense In Depth;" 1st July 2016 – 30th June 2020, $499,981 (**sole PI**). PM Dr. Sol J. Greenspan.
- *United States Air Force & Air Force Research Laboratory,* FA8750-16-C-0260, "Thunderlane Phase II;" 1st September 2018 – 12th March 2020, $457,672 (**sole PI** on sub-award for $457,672 from prime contractor Assured Information Security, Inc. / Adam Hovak).
- *DARPA, Cyber Fault-tolerant Attack Recovery (CFAR) Program,* FA8750-15-C-0124, "Robust, Assured Diversity for Software Security (RADSS)." In August of 2017, **award was increased by $217,597** and the duration extended to the end of March 2019. The modified award now runs 13th May 2015 – 31st March 2019, $2,199,227 (**sole PI** on sub-award for $2,199,227 from prime contractor Galois, Inc. / Stephen Magill). PMs Dr. John Everett and Dr. Jacob Torrey.
- *United States Air Force & Air Force Research Laboratory,* FA8750-16-C-0260, "Thunderlane;" 19th September 2016 – 24th May 2017, $45,000 (**sole PI** on sub-award for $45,000 from prime contractor Assured Information Security, Inc. / Philip White).

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- *National Science Foundation, Secure & Trustworthy Cyberspace (SaTC) Program,* CNS-1513837, "ENCORE—ENhanced program protection through COmpiler-REwriter cooperation;" 1st July 2015 – 30th June 2018, $1,199,953 (**lead PI**. This was a collaborative award with Matthias Payer of Purdue University and Kevin Hamlen of The University of Texas at Dallas. My share of the award was $619,267.) PM Dr. Sol J. Greenspan.
- *DARPA, Cyber Fault-tolerant Attack Recovery (CFAR) Program,* FA8750-15-C-0124, "Robust, Assured Diversity for Software Security (RADSS)," 13th May 2015 – 1st November 2018, $1,975,630 (**sole PI** on sub-award for $1,975,630 from prime contractor Galois, Inc. / Stephen Magill). PM Dr. John Everett.
- *DARPA, Cyber Fault-tolerant Attack Recovery (CFAR) Program,* FA8750-15-C-0085, "RAVEN," 5th May 2015 – 31st March 2019, $702,271 (**sole PI** on sub-award for $702,271 from prime contractor Apogee Research, LLC / Tiffany Frazier). PM Dr. John Everett.
- *DARPA, I2O Vetting Commodity IT Software and Firmware (VET) Program,* N66001-13-C-4057, "Heterogeneous Compilations for Detection of Malice in Embedded Systems," 1st February 2015 – 30th June 2015, $64,999 (**sole PI** on sub-award for $64,999 from prime contractor Apogee Research, LLC / Tiffany Frazier). PM Dr. Timothy Fraser.
- *National Science Foundation, Computing and Communications Foundations Program,* IIP-1439439, "I-Corps: Hardening Programs Against Cyber Attacks," 1st June 2014 – 30th November 2015, $50,000 (**sole PI**). PM Dr. Rathinda Dasgupta.
- *DARPA, I2O Clean-Slate Design of Resilient, Secure Hosts (CRASH) Program & Transformative Apps Program,* D11PC20024, "Defending Mobile Apps Through Automated Software Diversity." In May of 2014, award was increased by $247,830 and duration extended to 30th September 2015. The modified award now runs 4th February 2011 – 30th September 2015, $2,095,432 (**sole PI**). PMs Dr. Howard Shrobe and Dr. Robert Laddaga.
- *DARPA, I2O Mission-Oriented Resilient Clouds (MRC) Program,* N66001124014, "Meta-Circular Software Diversity for Intrusion Tolerant Clouds," 1st July 2012 – 31st October 2015, $456,809 (**sole PI** on this sub-award for $456,809, which is part of a larger project led by Yair Amir awarded to Johns Hopkins University). PMs Dr. Howard Shrobe and Dr. Robert Laddaga.
- *DARPA, I2O Clean-Slate Design of Resilient, Secure Hosts (CRASH) Program & Transformative Apps Program,* D11PC20024, "Defending Mobile Apps Through Automated Software Diversity." In June of 2012, award was increased by $467,442 and duration extended by an additional year. Modified award now runs 4th February 2011 – 3rd February 2015, $1,847,602 (**sole PI**). PMs Dr. Howard Shrobe, Dr. Robert Laddaga, and Dr. Mari Maeda.
- *National Science Foundation, Computing and Communications Foundations Program,* CCF-1117162, "SHF: CSR: Small: Fine-Grained Modularity and Reuse of VM Components," 1st August 2011 – 31st July 2014, $499,867 (**sole PI**). PM Dr. Bill Pugh.
- *DARPA, Clean-Slate Design of Resilient, Secure Hosts (CRASH) Program & Transformative Apps Program,* D11PC20024, "Defending Mobile Apps Through Automated Software Diversity," 4th February 2011 – 3rd February 2014, $1,380,162 (**sole PI**). PMs Dr. Howard Shrobe and Dr. Mari Maeda.
- *Samsung Telecommunications America,* Richardson, Texas, Agreement No. 51070, "Fine-Grained Modularity and Reuse of Virtual-Machine Components," 1st January 2011 – 31st December 2011, $349,965 (**sole PI**). PM Venky Raju.
- *National Science Foundation, Trusted Computing Program,* CNS-0905684, "Next-Generation Infrastructure for Trustworthy Web Applications," 1st September 2009 – 31st August 2012, $600,000 (**lead PI**, award is split evenly with co-PI C. Flanagan of UC Santa Cruz). PM Dr. Karl Levitt.
- *California MICRO Program* and industrial sponsor *Sun Microsystems, Inc.,* Project No. 07-127, "Trace Compilation for a Server Java Virtual Machine," 24th August 2007 – 30th June 2009, $81,500 ($50,000 gift from sponsor, $31,500 matching cash contribution from MICRO, waiver of overhead charges applies to the total grant amount; **sole PI**).

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- *National Intelligence Community, Enterprise Cyber Assurance Program (NICECAP),* FA8750-07-2-0085, "Leveraging Parallel Hardware to Detect, Quarantine, and Repair Malicious Code Injection," 17th May 2007 – 17th August 2009, $1,020,375 (**sole PI**). PM Dr. Carl Landwehr. (This solicitation drew 265 responses, of which 11, including this one, were funded. Among the 11 funded projects, 4 were from M.I.T. and one each from Carnegie-Mellon, Columbia, Cornell, Stanford, and UT Austin. UC Irvine was the only university in the competition to receive a grant awarded to a sole Principal Investigator.)

- *National Science Foundation, Trusted Computing Program,* CNS-0627747, "MLS-VM: Design and Implementation of a Next-Generation Information-Centric Target Platform for Trusted Internet Computing," 1st September 2006 – 31st August 2010, $400,000 (**sole PI**). PM Dr. Helen Gill.

- *National Science Foundation, Embedded and Hybrid Systems Program,* CNS-0615443, "Virtual-Machine Techniques for Resource-Constrained Devices: Reconciling Reliability With Reusability and Low Development Costs in the Embedded Systems Space," 1st July 2006 – 30th June 2010, $300,000 (**sole PI**). PM Dr. Helen Gill.

- *United States Homeland Security Advanced Research Projects Agency (HSARPA),* FA8750-05-2-0216, "Adding Mandatory Access Control to Virtual Machines", 2nd May 2005 – 1st November 2007, $312,483 (**sole PI**). PM Dr. Douglas Maughan. (My proposal was the only one of 80 submissions in the category "Vulnerability Prevention" that got funded by DHS. Overall, the Homeland Security solicitation drew 583 responses, of which 17, including this one, were funded.)

- *California MICRO Program* and industrial sponsor *Microsoft Research,* Project No. 04-032, "Executing Legacy Machine Code on a Safe Virtual Machine," 11th August 2004 – 30th June 2005, $46,881 (waiver of overhead charges applies to the total grant amount; **sole PI**).

- *Deutsche Forschungsgemeinschaft (DFG)* [German National Science Foundation], AM-150/1-3, "SafeTSA: Entwicklung syntaxorientierter Verfahren zur sicheren und effizienten Ausführung von mobilem Code," 1st March 2004 – 28th February 2006, Euro 140,000 (equal co-PI with W. Amme and W. Rossak of the University of Jena, Germany). (This is a new grant that provides continuing support for an earlier DFG-funded research project listed below.)

- *National Science Foundation, Information Technology Research (ITR),* CCR-0205712, "Virtual Power for a Wireless Campus: Orchestrated Modeling, Analysis, Composition and Compilation Strategies for Distributed Embedded Systems," 1st September 2002 – 31st August 2005, $2,000,796 (**lead PI** with C. Krintz and R. Wolski of UC Santa Barbara). PM Dr. Helen Gill. (Award is split $500,000 to Franz, Krintz and Wolski each, with a further $500,000 going to an internal sub-contract at UC Irvine with Senior Personnel P. Chou, N. Dutt, and T. Givargis.)

- *National Science Foundation, Trusted Computing Program,* CCR-TC-0209163, "Practical Language-Based Security, From the Ground Up," 1st August 2002 – 31st July 2005, $300,000 (**sole PI**). PM Dr. Carl Landwehr.

- *DARPA Information Systems Office,* F30602-99-1-0536, "New Approaches to Mobile Code: Reconciling Execution Efficiency With Provable Security," follow-on effort, 22nd June 2002 – 30th September 2003, additional $207,632 (**sole PI**). PM Dr. Jaynarayan H. Lala.

- *Deutsche Forschungsgemeinschaft (DFG)* [German National Science Foundation], AM-150/1-1, "SafeTSA: Entwicklung syntaxorientierter Verfahren zur sicheren und effizienten Ausführung von mobilem Code," 23rd August 2001 – 1st February 2004, Euro 135,000 [corresponding to 270,000 Deutsche Marks] (equal Co-PI with W. Amme and W. Rossak of the University of Jena, Germany).

- *National Science Foundation, Operating Systems and Compilers Program,* CCR-0105710, "Design and Implementation of Component-Oriented Programming Languages," 1st July 2001 – 30th June 2004, $240,000 (**sole PI**). PM Dr. Xiaodong Zhang.

- *Department of Defense, Critical Infrastructure Protection and High Confidence, Adaptable Software (CIP/SW) Research Program of the University Research Initiative,* N00014-01-1-0854, "A Comprehensive Context for Mobile-Code Deployment," 1st May 2001 – 30th September 2004, $981,121, (**lead PI** with B. Fleisch of UC Riverside). PMs Frank Deckelman and Dr. Ralph Wachter. (Award is split $793,201 to Franz and $187,920 to Fleisch. According to the ONR website, "the competition drew 115 white papers, from which 74 proposals were received. After a thorough evaluation by technical expert teams, 20 of these proposals were selected for funding.")

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- *National Science Foundation, Next Generation Software Program,* EIA-9975053, "TMO Based Modeling and Design of Reliable Next-Generation Complex Software," 15th August 1999 – 14th August 2002, $550,000 (with K. Kim, Principal Investigator, and P. C.-Y. Sheu, Department of Electrical and Computer Engineering, UC Irvine). PM Dr. Frederica Darema. ($117,000 of the total allocated to co-PI Franz.)
- *National Science Foundation, Operating Systems and Compilers Program,* CCR-9901689, "Graph-Based Mobile-Code Representations for High-Performance Portable Software," 1st September 1999 – 31st August 2002, $180,000 (**sole PI**). PM Dr. Mukesh Singhal.
- *California MICRO Program* and industrial sponsor *Microsoft Research,* Project No. 99-039, "An Infrastructure for Dynamic Optimization at Run-Time," 2nd August 1999 – 30th June 2000, $38,000 (waiver of overhead charges applies to the total grant amount; **sole PI**).
- *DARPA Information Systems Office,* F30602-99-1-0536, "New Approaches to Mobile Code: Reconciling Execution Efficiency With Provable Security," 22nd June 1999 – 21st June 2002, $720,741 (**sole PI**). PM Dr. Jaynarayan H. Lala.
- *National Science Foundation CAREER Award*, CCR-9701400, "Dynamic Optimization of Software Component Systems," 1st March 1997 – 28th February 2001, $205,000 (**sole PI**).

Supplementary Awards

- National Science Foundation, Research Experiences for Undergraduates (REU) Award Supplement for Grant CNS-0905684, Summer 2011, $16,000.
- National Science Foundation, Research Experiences for Undergraduates (REU) Award Supplement for Grant CNS-0905684, Summer 2010, $8,000.
- National Science Foundation, Research Experiences for Undergraduates (REU) Award Supplement for Grant CNS-0627747, Summer 2007, $6,000.
- National Science Foundation, Research Experiences for Undergraduates (REU) Award Supplement for Grant CNS-0615443, Summer 2007, $6,000.
- National Science Foundation, Research Experiences for Undergraduates (REU) Award Supplement for Grant CCR-0205712, Summer 2004, $6,000.
- National Science Foundation, Research Experiences for Undergraduates (REU) Award Supplement for Grant CCR-0205712, Summer 2003, $10,000.
- National Science Foundation, Research Experiences for Undergraduates (REU) Award Supplement for Grant CCR-9701400, Summer 1998, $5,000.

Unrestricted Gifts

- Oracle Corporation, $100,000; May 2016.
- Qualcomm Corporation, $40,000; May 2015.
- Oracle Corporation, $140,000; August 2014.
- Mozilla Corporation, $83,000; August 2014.
- Oracle Corporation, $33,000; September 2013.
- Adobe Corporation, $25,000; August 2011.
- Google Corporation, $61,000; June 2011.
- Adobe Corporation, $35,000; August 2010.

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- Adobe Corporation, $40,000; March 2010.
- Mozilla Corporation, $85,000; December 2009.
- Sun Microsystems, $80,000; May 2009.
- Google Corporation, $50,000; January 2008.
- Mozilla Corporation, $85,000; May 2007.
- Intel Corporation, $30,000; April 2006.
- Intel Corporation, $30,000; June 2005.
- Sun Microsystems Laboratories, $56,031; September 2004
- Intel Corporation, $30,000; July 2004.
- Microsoft Research, $33,183, April 2004.

Other Gifts

- Amazon Corporation., $18,000 in Amazon Web Services credit; September 2012.

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Publications

Awarded Patents

P.6 P. Larsen (lead), S. Brunthaler, and M. Franz; *Error Report Normalization*; United States Patent No. 10,430,265; filed October 2015, issued October 2019.

P.5 M. Franz (lead), A. Homescu, S. Brunthaler, and P. Larsen; *Code Randomization for Just-In-Time Compilers*; United States Patent No. 9,250,937; filed November 2014, issued February 2016.

P.4 A. Gal (lead) and M. Franz; *Dynamic Incremental Compiler and Method*; United States Patent No. 8,769,511; filed February 2007, issued July 2014.

P.3 M. Franz (lead), W. Amme, and J. von Ronne; *Safe Computer Code Formats And Methods For Generating Safe Computer Code*; United States Patent No. 8,392,897; filed August 2006, issued March 2013.

P.2 M. Franz (lead), A. Gal, and B. Salamat; *Multi-Variant Parallel Program Execution to Detect Malicious Code Injection*; United States Patent No. 8,239,8367 B1; filed March 2008, issued August 2012.

P.1 M. Franz (lead), W. Amme, and J. von Ronne; *Safe Computer Code Formats And Methods For Generating Safe Computer Code*; United States Patent No. 7,117,488; filed October 2001, issued October 2006.

Books

B.2 P. Larsen, S. Brunthaler, L. Davi, A.-R. Sadeghi, and M. Franz; *Automated Software Diversity;* Morgan & Claypool, San Rafael, California, ISBN 978-1-6270-5734-9 (paperback), ISBN 978-1-6270-5755-4 (ebook); December 2015. doi:10.2200/S00686ED1V01Y201512SPT014

B.1 M. Franz; *Code-Generation On-the-Fly: A Key to Portable Software,* Doctoral Dissertation No. 10497, ETH Zürich; published in book form by Verlag der Fachvereine, Zürich, ISBN 3-7281-2115-0; March 1994.

Edited Volumes

E.1 M. Franz and P. Papadimitratos (Eds.); *Trust and Trustworthy Computing (Proceedings of the 9th International Conference, TRUST 2016 Vienna, Austria, August 29–30, 2016);* Springer, Heidelberg, ISBN 978-3-319-45571-6 (paperback), ISBN 978-3-319-45572-3 (ebook); August 2016. doi:10.1007/978-3-319-45572-3

Peer-Reviewed Book Chapters

BC.10 S. Crane, A. Homescu, P. Larsen, H. Okhravi, and M. Franz; "Diversity and Information Leaks;" in P. Larsen and A.-R. Sadeghi (Eds.), *The Continuing Arms Race: Code-Reuse Attacks and Defenses,* ACM Books, Vol. 18, Morgan & Claypool Publishers, ISBN 978-1-97000-183-9, pp. 61–81; 2018. doi:10.1145/3129743.3129747

BC.9 T. Jackson, A. Homescu, S. Crane, P. Larsen, S. Brunthaler, and M. Franz; "Diversifying the Software Stack Using Randomized NOP Insertion;" in S. Jajodia, A. K. Ghosh, V. S. Subrahmanian, V. Swarup, C. Wang, X. S. Wang (Eds.), *Moving Target Defense II: Application of Game Theory and Adversarial Modeling,* Springer Advances in Information Security, Vol. 100, ISBN 978-1-4614-5415-1, pp. 151–174; 2013. doi:DOI 10.1007/978-1-4614-5416-8_8

BC.8 T. Jackson, B. Salamat, A. Homescu, K. Manivannan, G. Wagner, A. Gal, S. Brunthaler, Ch. Wimmer, and M. Franz; "Compiler-Generated Software Diversity;" in S. Jajodia, A.K. Ghosh, V. Swarup, C. Wang, and X.S. Wang (Eds.), *Moving Target Defense: Creating Asymmetric Uncertainty for Cyber Threats*; Springer, ISBN 978-1-4614-0976-2, pp. 77–98; September 2011. doi:10.1007/978-1-4614-0977-9_4

BC.7 M. Franz, W. Amme, M. Beers, N. Dalton, P.H. Fröhlich, V. Haldar, A. Hartmann, P. S. Housel, F. Reig, J. von Ronne, Ch.H. Stork, and S. Zhenochin; "Making Mobile Code Both Safe And Efficient;" in J. Lala (Ed.), *Foundations of Intrusion Tolerant Systems*; IEEE Computer Society Press, ISBN 0-7695-2057-X, pp. 337–356; December 2003. doi:10.1109/FITS.2003.1264941 (Expanded version of conference paper C.15)

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BC.6 M. Franz; "A Fresh Look At Low-Power Mobile Computing;" in L. Benini, M. Kandemir, J. Ramanujam (Eds.), *Compilers and Operating Systems for Low Power*; Kluwer Academic Publishers, Boston, ISBN 1-4020-7573-1, pp. 209–220; September 2003. doi:10.1007/978-1-4419-9292-5_12 (Expanded version of conference paper C.18)

BC.5 M. Franz; "Safe Code: It's Not Just For Applets Anymore;" in L. Böszörményi and Peter Schojer (Eds.), *Modular Programming Languages: Proceedings of the Sixth Joint Modular Languages Conference (JMLC 2003),* Klagenfurt, Austria; Springer Lecture Notes in Computer Science, No. 2789, ISBN 3-540-40796-0; pp. 12–22; August 2003. (Full Text of Invited Keynote Address)

BC.4 J. von Ronne, A. Hartmann, W. Amme, and M. Franz; "Efficient Online Optimization by Utilizing Offline Analysis and the SafeTSA Representation;" in J. Powers and J. T. Waldron (Eds.), *Recent Advances in Java Technology: Theory, Application, Implementation*; Computer Science Press, Trinity College Dublin, Dublin, Ireland, ISBN 0-9544145-0-0, pp. 233–241; November 2002. (Expanded version of conference paper C.22)

BC.3 M. Franz; "Oberon: The Overlooked Jewel;" in L. Böszörményi, J. Gutknecht, G. Pomberger (Eds.), *The School of Niklaus Wirth: The Art of Simplicity*; Morgan Kaufmann, San Francisco; ISBN 1-55860-723-4, pp. 41–53; September 2000.

BC.2 J. Gutknecht and M. Franz; "Oberon with Gadgets: A Simple Component Framework;" in M. Fayad, D. Schmidt, R. Johnson (Eds.), *Implementing Application Frameworks: Object-Oriented Frameworks at Work*; Wiley, ISBN 0-4712-5201-8, pp. 323–338; September 1999.

BC.1 M. Franz; "Adaptive Compression of Syntax Trees and Iterative Dynamic Code Optimization: Two Basic Technologies for Mobile-Object Systems;" in J. Vitek and Ch. Tschudin (Eds.), *Mobile Object Systems: Towards the Programmable Internet*; Springer Lecture Notes in Computer Science, No. 1222, ISBN 3-540-62852-5, pp. 263–276; February 1997. doi:10.1007/3-540-62852-5_19

Strongly Reviewed Journal & Magazine Articles

Note: Several conference proceedings have appeared as "special issues" of journals. My contributions to such journal special issues that contain regular conference proceedings are ***not*** *included in this section but are listed under "conference papers" below.*

J.37 A. Rösti, A. Voulimeneas, and M. Franz; "The Astonishing Evolution of Probabilistic Memory Safety: From Basic Heap-Data Attack Detection Toward Fully Survivable Multivariant Execution;" in *IEEE Security and Privacy,* Vol. 22, No. 4, pp. 66–75; July/August 2024. doi:10.1109/MSEC.2024.3407648

J.36 B. Belleville, W. Shen, S. Volckaert, A.M. Azab, and M. Franz; "KALD: Detecting Direct Pointer Disclosure Vulnerabilities;" in *IEEE Transactions on Dependable and Secure Computing (TDSC),* Vol 18, No. 3, pp. 1369–1377; May/June 2021 (first online publication May 2019). doi:10.1109/TDSC.2019.2915829

J.35 M. Franz; "Making Multivariant Programming Practical and Inexpensive;" in *IEEE Security and Privacy,* Vol. 16, No. 3, pp. 90–94; May 2018. doi:10.1109/MSP.2018.2701161

J.34 N. Burow, S.C. Carr, J. Nash, P. Larsen, M. Franz, S. Brunthaler, and M. Payer; "Control-Flow Integrity P^3: Protection, Precision, and Performance," in *ACM Computing Surveys (CSUR),* Vol. 50, No. 1, Article No. 16; April 2017. doi:10.1145/3054924

J.33 A. Homescu, T. Jackson, S. Crane, S. Brunthaler, P. Larsen, and M. Franz; "Large-scale Automated Software Diversity—Program Evolution Redux;" in *IEEE Transactions on Dependable and Secure Computing (TDSC),* Vol. 14, No. 2, March/April 2017. doi:10.1109/TDSC.2015.2433252

J.32 G. Wagner, P. Larsen, S. Brunthaler, and M. Franz; "Thinking Inside the Box: Compartmentalized Garbage Collection;" in *ACM Transactions on Programming Languages and Systems (TOPLAS),* Vol. 38, No. 3, Article No. 9; May 2016. doi:10.1145/2866576

J.31 P. Larsen, A. Homescu, S. Brunthaler, and M. Franz; "Automatic Software Diversity;" in *IEEE Security and Privacy,* Vol. 13, No. 2, pp. 30-37; March 2015. doi:10.1109/MSP.2015.23

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J.30 G. Savrun-Yeniceri, W. Zhang, H. Zhang, E. Seckler, C. Li, S. Brunthaler, P. Larsen, and M. Franz; "Efficient Hosted Interpreters on the JVM;" in *ACM Transactions on Architecture and Code Optimization (TACO),* Vol. 11, No. 1, Article No. 9; February 2014. doi:10.1145/2532642

J.29 P. Larsen, S. Brunthaler, and M. Franz; "Security through Diversity: Are We There Yet?;" in *IEEE Security and Privacy,* Vol. 12, No. 2, pp. 28–35; March 2014. doi:10.1109/MSP.2013.129

J.28 Ch. Kerschbaumer, E. Hennigan, P. Larsen, S. Brunthaler, and M. Franz; "Information Flow Tracking meets Just-In-Time Compilation;" in *ACM Transactions on Architecture and Code Optimization (TACO),* Vol. 10, No. 4, Article No. 38; December 2013. doi:10.1145/2541228.2555295

J.27 G. Wagner, A. Gal, and M. Franz; "Slimming a Java Virtual Machine by way of Cold Code Removal and Optimistic Partial Program Loading;" in *Science of Computer Programming,* Vol. 76, No. 11, pp. 1037–1053; November 2011. doi:10.1016/j.scico.2010.04.008 (Expanded version of conference paper C.53)

J.26 B. Salamat, T. Jackson, G. Wagner, Ch. Wimmer, and M. Franz; "Run-Time Defense Against Code Injection Attacks Using Replicated Execution;" in *IEEE Transactions on Dependable and Secure Computing (TDSC),* Vol. 8, No. 4; July 2011. doi:10.1109/TDSC.2011.18

J.25 W. Amme, J. von Ronne, Ph. Adler, and M. Franz; "The Effectiveness of Producer-Side Machine-Independent Optimizations for Mobile Code;" in *Software—Practice and Experience)*, Vol. 39, No. 10, pp. 923–946; July 2009. doi:10.1002/spe.v39:10 (Expanded version of conference paper C.40)

J.24 E. Yardimci and M. Franz; "Mostly Static Program Partitioning of Binary Executables;" in *ACM Transactions on Programming Languages and Systems (TOPLAS)*, Vol. 31, No. 5, Article No. 17; June 2009. doi:10.1145/1538917.1538918

J.23 A. Gal, Ch.W. Probst, and M. Franz; "Java Bytecode Verification via Static Single Assignment Form;" *ACM Transactions on Programming Languages and Systems (TOPLAS),* Vol. 30, No. 4, Article No. 21, pp. 1–21; July 2008. doi:10.1145/1377492.1377496

J.22 E. Yardimci and M. Franz; "Dynamic Parallelization of Binary Executables on Hierarchical Platforms;" *The Journal of Instruction-Level Parallelism,* Vol. 10, Paper 6, ISSN 1942-9525, pp. 1–24; June 2008. http://www.jilp.org/vol10/v10paper6.pdf (Expanded version of conference paper C.41)

J.21 M. Franz; "Containing the Ultimate Trojan Horse;" *IEEE Security and Privacy,* Vol. 5, No. 4, pp. 52–56; July 2007. doi:10.1109/MSP.2007.77

J.20 W. Amme, J. von Ronne, and M. Franz; "SSA-Based Mobile Code: Implementation and Empirical Evaluation;" *ACM Transactions on Architecture and Code Optimization (TACO),* Vol. 4, No. 2, Article No. 13; June 2007. doi:10.1145/1250727.1250733

J.19 V. Venkatachalam, M. Franz, and Ch.W. Probst; "A New Way Of Estimating Compute Boundedness And Its Application To Dynamic Voltage Scaling;" *International Journal of Embedded Systems (IJES)*, Vol. 3, No. 1/2, pp. 17–30; 2007. doi:10.1504/IJES.2007.016030

J.18 V. Venkatachalam and M. Franz; "Power Reduction Techniques For Microprocessor Systems;" *ACM Computing Surveys (CSUR),* Vol. 37, No. 3, pp. 195–237; September 2005. doi:10.1145/1108956.1108957

J.17 M. Franz, D. Chandra, A. Gal, V. Haldar, Ch.W. Probst, F. Reig, and N. Wang; "A Portable Virtual Machine Target For Proof-Carrying Code;" *Science of Computer Programming,* (Special Issue on Interpreters, Virtual Machines, and Emulators), Vol. 57, No. 3, pp. 275–294; September 2005. doi:10.1016/j.scico.2004.09.001 (Expanded version of conference paper C.28)

J.16 M. Franz, P.H. Fröhlich, and A. Gal; "Supporting Software Composition at the Programming-Language Level;" *Science of Computer Programming,* (Special Issue on New Software Composition Concepts), Vol. 56, Nos. 1–2, pp. 41–57; April 2005. doi:10.1016/j.scico.2004.11.004

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J.15 W. Amme and M. Franz; "Effiziente Codegenerierung für mobilen Code;" *Informatik-Spektrum,* Vol. 26, No. 4, pp. 237–246; August 2003. doi:10.1007/s00287-003-0317-1

J.14 T. Kistler and M. Franz; "Continuous Program Optimization: A Case Study;" *ACM Transactions on Programming Languages and Systems (TOPLAS),* Vol. 25, No. 4, pp. 500–548; July 2003. doi:10.1145/778559.778562

J.13 T. Kistler and M. Franz; "Continuous Program Optimization: Design and Evaluation;" *IEEE Transactions on Computers,* Vol. 50, No. 6, pp. 549–566; June 2001. doi:10.1109/12.931893

J.12 T. Kistler and M. Franz; "Automated Data-Member Layout of Heap Objects to Improve Memory-Hierarchy Performance;" *ACM Transactions on Programming Languages and Systems (TOPLAS),* Vol. 22, No. 3, pp. 490–505; May 2000. doi:10.1145/353926.353937

J.11 T. Kistler and M. Franz; "A Tree-Based Alternative to Java Byte-Codes;" *International Journal of Parallel Programming,* Vol. 27, No. 1, pp. 21–34; February 1999. doi:10.1023/A:1018740018601 (Expanded version of conference paper C.05)

J.10 M. Franz; "The Java Virtual Machine: A Passing Fad?;" *IEEE Software,* Vol. 15, No. 6, pp. 26–29; November 1998. doi:10.1109/52.730834

J.09 M. Franz; "Open Standards Beyond Java: On the Future of Mobile Code for the Internet;" *Journal of Universal Computer Science (j.ucs),* Vol. 4, No. 5, pp. 521–532; May 1998. doi:10.3217/jucs-004-05-0522 (Expanded version of conference paper C.08)

J.08 M. Franz; "Java: Anmerkungen eines Wirth-Schülers" (in German); *Informatik-Spektrum,* Vol. 21, No. 1, pp. 23–26; February 1998. doi:10.1007/s002870050086

J.07 M. Franz and T. Kistler; "Slim Binaries;" *Communications of the ACM,* Vol. 40, No. 12, pp. 87–94; December 1997. doi:10.1145/265563.265576

J.06 M. Franz; "The Programming Language Lagoona: A Fresh Look at Object-Orientation;" *Software-Concepts and Tools,* Vol. 18, No. 1, pp. 14–26; March 1997.

J.05 M. Franz; "Dynamic Linking of Software Components;" *IEEE Computer,* Vol. 30, No. 3, pp. 74–81; March 1997. doi:10.1109/2.573670

J.04 M. Brandis, R. Crelier, M. Franz, and J. Templ; "The Oberon System Family;" *Software—Practice and Experience,* Vol. 25, No. 12, pp. 1331–1366; December 1995.

J.03 M. Franz; "Protocol Extension: A Technique for Structuring Large Extensible Software-Systems;" *Software—Concepts and Tools,* Vol. 16, No. 2, pp. 86–94; July 1995.

J.02 M. Franz; "The Case for Universal Symbol Files;" *Structured Programming,* Vol. 14, No. 3, pp. 136–147; October 1993.

J.01 M. Franz; "Emulating an Operating System on Top of Another;" *Software—Practice and Experience,* Vol. 23, No. 6, pp. 677–692; June 1993.

Strongly Reviewed Conference and Workshop Papers

Note: Several conference proceedings have appeared as "special issues" of journals. They are included in this section rather than under "journal articles" above, and for faster identification have been marked with an asterisk. Talks given at conferences are annotated in this section and are not listed again under "presentations" below.

C.122 A. Rösti, S. Volckaert, M. Franz, and A. Voulimeneas; "I'll Be There for You! Perpetual Availability in the A^8 MVX System;" in *2024 Annual Computer Security Applications Conference (ACSAC 2024),* Honolulu, Hawaii, IEEE Press, ISBN 979-8-3315-2088-5, pp. 520–533; December 2024. doi:10.1109/ACSAC63791.2024.00052 **Distinguished Paper with Artifact Award.** 83 papers accepted out of 424 total papers submitted to the conference; 381 papers were reviewed after what the program committee called "aggressive desk rejects" = 21.8% acceptance rate of the strictly reviewed papers. 2 papers, including ours, received awards at the conference.

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C.121 F. Parzefall, C. Deshpande, F. Hetzelt, and M. Franz; "What You Trace is What You Get: Dynamic Stack-Layout Recovery for Binary Recompilation;" in *2024 ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2024),* San Diego, California, ACM Press, ISBN 979-8-4007-0385-0, pp. 1250–1263; April 2024. doi:10.1145/3620665.3640371 170 papers accepted out of 912 submissions, with 33 revisions still outstanding = expected acceptance rate of 20-21%.

C.120 C. Deshpande, F. Parzefall, F. Hetzelt, and M. Franz; "Polynima—Practical Hybrid Recompilation for Multi-threaded Binaries;" in *Nineteenth European Conference on Computer Systems (EuroSys 2024),* Athens, Greece, ACM Press, ISBN 979-8-4007-0437-6, pp. 1126–1141; April 2024. doi:10.1145/3627703.3650065 71 papers accepted out of 484 submissions = 14.6%.

C.119 M.-Y. Hsu, F. Hetzelt, D. Gens, M. Maitland, and M. Franz; "A Highly Scalable, Hybrid, Cross-Platform Timing Analysis Framework Providing Accurate Differential Throughput Estimation via Instruction-Level Tracing;" in *2023 ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2023),* San Francisco, California, ACM Press, ISBN 979-8-4007-0327-0, pp. 821–831; December 2023. doi:10.1145/3611643.3616246 **SIGSOFT Distinguished Paper Award.** Our paper was one of 60 papers accepted outright out of 473 submissions = 12.6%; an additional 82 papers were sent back for a major revision. The second round of reviews resulted in 67 more papers being accepted and 12 rejected, with the final tally being 127 accepted papers = 27%.

C.118 G. Kim, M. Franz, and J. Kim; "The Ticket Price Matters in Sharding Blockchain," 6th International Workshop on Cryptocurrencies and Blockchain Technology (CBT 2022); published as J. Garcia-Alfaro, G. Navarro-Arribas, H. Hartenstein, and J. Herrera-Joancomarti (Eds.), *Data Privacy Management, Cryptocurrencies and Blockchain Technology: ESORICS 2022 International Workshops, DPM 2022 and CBT 2022, Copenhagen, Denmark, September 26–30, 2022, Revised Selected Papers,* Springer Lecture Notes in Computer Science, Vol. 10,436; ISBN 978-3-031-25733-9; 2023. doi:10.1007/978-3-031-25734-6_12

C.117 G. Kim, S. Hong, M. Franz, and D.K. Song; "Improving Cross-Platform Binary Analysis using Representation Learning via Graph Alignment;" in *ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA 2022),* Seoul, South Korea, ACM Press, ISBN 978-1-4503-9379-9, pp. 151–163; July 2022. doi:10.1145/3533767.3534383 61 papers accepted out of 250 submissions = 25.6%

C.116 P. Kirth, M. Dickerson, S. Crane, P. Larsen, A. Dabrowski, D. Gens, Y. Na, S. Volckaert, and M. Franz; "PKRU-Safe: Automatically Locking Down the Heap Between Safe and Unsafe Languages;" in *EuroSys 2022*, Rennes, France, ACM Press, ISBN 978-1-4503-9162-7, pp. 132–148; April 2022. doi:10.1145/3492321.3519582 **Best Paper Award.** 45 papers accepted out of 161 submissions = 27.6%

C.115 C. Deshpande, D. Gens, and M. Franz; "StackBERT: Machine Learning Assisted Static Stack Frame Size Recovery On Stripped and Optimized Binaries;" in *14th ACM Workshop on Artificial Intelligence and Security (AISec 2021),* Seoul, South Korea, ACM Press, ISBN 978-1-4503-8657-9, pp. 85–95; November 2021. doi:10.1145/3474369.3486865

C.114 A. Dabrowski, K. Pfeffer, M. Reichel, A. Mai, E. Weippl, and M. Franz; "Better Keep Cash in Your Boots—Hardware Wallets Are the New Single Point of Failure;" in *2021 ACM Workshop on Decentralized Finance and Security (DeFi21),* Seoul, South Korea, ACM Press, ISBN 978-1-4503-8540-4; November 2021. doi:10.1145/3464967.3488588

C.113 K. Pfeffer, A. Mai, A. Dabrowski, M. Gusenbauer, P. Schindler, E. Weippl, M. Franz, and K. Krombholz; "On the Usability of Authenticity Checks for Hardware Security Tokens;" in *USENIX Security 2021,* Vancouver, British Columbia, USENIX Association, ISBN 978-1-939133-24-3, pp. 37–54; August 2021. 248 papers accepted out of 1,319 submissions = 18.8%

C.112 A. Voulimeneas, D. Song, P. Larsen, M. Franz, and S. Volckaert, "dMVX: Secure and Efficient Multi-Variant Execution in a Distributed Setting;" in *14th European Workshop on Systems Security (EuroSec 2021),* Edinburgh, Scotland, ACM Press, ISBN 978-1-4503-8337-0, pp.41–47; April 2021. doi:10.1145/3447852.3458714

C.111 P. Larsen and M. Franz; "Adoption Challenges of Code Randomization," in *7th ACM Workshop on Moving Target Defense (MTD 2020),* ACM Press, ISBN 978-1-4503-8085-0, pp. 45–49; November 2020. doi:10.1145/3411496.3421226.

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C.110 D. Song, F. Hetzelt, J. Kim, B. Kang, J. Seifert, and M. Franz; "Agamotto: Accelerating Kernel Driver Fuzzing with Lightweight Virtual Machine Checkpoints;" in *USENIX Security 2020,* Boston, Massachusetts, USENIX Association, ISBN 978-1-939133-17-5, pp. 2541–2557; August 2020. 157 papers accepted out of 977 submissions = 16%

C.109 Z. Kenjar, T. Frassetto, D. Gens, M. Franz, and A. Sadeghi; "V0LTpwn: Attacking x86 Processor Integrity from Software;" in *USENIX Security 2020,* Boston, Massachusetts, USENIX Association, ISBN 978-1-939133-17-5, pp. 1445–1461; August 2020. 157 papers accepted out of 977 submissions = 16%

C.108 P. Rajasekaran, S. Crane, D. Gens, Y. Na, S. Volckaert, and M. Franz; "CoDaRR : Continuous Data Space Randomization against Data-Only Attacks;" in *15th ACM ASIA Conference on Computer and Communications Security (ACM ASIACCS 2020),* Taipei, Taiwan; June 2020 (moved to October 2020). 67 papers accepted out of 308 submissions = 22%

C.107 A. Voulimeneas, D. Song, F. Parzefall, Y. Na, P. Larsen, M. Franz, and S. Volckaert; "Distributed Heterogeneous N-Variant Execution;" in C. Maurice, L. Bilge, G. Stringhini, and N. Neves (Eds)., *Detection of Intrusions and Malware, and Vulnerability Assessment (DIMVA 2020), 17th International Conference,* Lisbon, Portugal, Springer Lecture Notes in Computer Science, Vol. 12223, ISBN 978-3-030-52682-5, pp. 326–348; June 2020. doi:10.1007/978-3-030-52683-2_11 13 papers accepted out of 45 submissions = 28.9%

C.106 A. Altinay, J. Nash, T. Kroes, P. Rajasekaran, D. Zhou, A. Dabrowski, D. Gens, Y. Na, S. Volckaert, C. Giuffrida, H. Bos, and M. Franz; "BinRec: Dynamic Binary Lifting and Recompilation;" in *EuroSys 2020,* Heraklion, Greece, ACM Press, ISBN 978-1-4503-6882-7; April 2020. doi:10.1145/3342195.3387550 43 papers accepted out of 234 submissions = 18%

C.105 T. Park, K. Dhondt, D. Gens, Y. Na, S. Volckaert, and M. Franz; "NoJITsu: Locking Down JavaScript Engines;" in *2020 Network and Distributed Systems Security Symposium (NDSS 2020),* San Diego, California, Internet Society, ISBN 1-891562-61-4; February 2020. doi:10.14722/ndss.2020.24262 88 papers accepted out of 506 submissions = 17%

C.104 D.K. Song, J. Lettner, P. Rajasekaran, Y. Na, S. Volckaert, P. Larsen, and M. Franz; "SoK: Sanitizing for Security;" in *40th IEEE Symposium on Security and Privacy,* San Francisco, California, ISBN 978-1-5386-6660-9, pp. 187–207; May 2019. doi:10.1109/SP.2019.00010 84 papers accepted out of 673 submissions plus 10 revised papers from the previous year = 12.5%

C.103 D.K. Song, F. Hetzelt, D. Das, Ch. Spensky, Y. Na, S. Volckaert, G. Vigna, Ch. Kruegel, J.-P. Seifert, and M. Franz; "PeriScope: An Effective Probing and Fuzzing Framework for the Hardware-OS Boundary;" in *2019 Network and Distributed Systems Security Symposium (NDSS 2019),* Internet Society, ISBN 1-891562-55-X, San Diego, California; February 2019. doi:10.14722/ndss.2019.23176 89 papers accepted out of 521 submissions = 17%

C.102 T. Kroes, A. Altinay, J. Nash, Y. Na, S. Volckaert, H. Bos, M. Franz, and Ch. Giuffrida; "BinRec: Attack Surface Reduction Through Dynamic Binary Recovery;" in Y. Shoshitaishvili, M. Naik (Eds.), *FEAST '18: Proceedings of the 2018 Workshop on Forming an Ecosystem Around Software Transformation,* Toronto, Canada, ACM Press, ISBN 978-1-4503-5997-9, pp. 8–13; October 2018. doi:10.1145/3273045.3273050

C.101 B. Belleville, H. Moon, J. Shin, D. Hwang, J.M. Nash, S. Jung, Y. Na, S. Volckaert, P. Larsen, Y. Paek, and M. Franz; "Hardware Assisted Randomization of Data;" in M. Bailey, Th. Holz, M. Stamatogiannakis, and S. Ioannidis (Eds.), *21st International Symposium on Research in Attacks, Intrusions, and Defenses (RAID 2018),* Heraklion, Crete, Greece, Springer Lecture Notes in Computer Science Vol. 11050, ISBN 978-3-030-00469-9, pp. 337–358; September 2018. doi:10.1007/978-3-030-00470-5_16 33 papers accepted out of 145 submissions = 23%

C.100 J. Lettner, D.K. Song, T. Park, S. Volckaert, P. Larsen, and M. Franz; "PartiSan: Fast and Flexible Sanitization via Run-time Partitioning;" in M. Bailey, Th. Holz, M. Stamatogiannakis, and S. Ioannidis (Eds.), *21st International Symposium on Research in Attacks, Intrusions, and Defenses (RAID 2018),* Heraklion, Crete, Greece, Springer Lecture Notes in Computer Science Vol. 11050, ISBN 978-3-030-00469-9, pp. 403–422; September 2018. doi:10.1007/978-3-030-00470-5_19 33 papers accepted out of 145 submissions = 23%

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C.99 M. Qunaibit, S. Brunthaler, Y. Na, S. Volckaert and M. Franz; "Accelerating Dynamically-Typed Languages on Heterogeneous Platforms Using Guards Optimization;" in T. Millstein (Ed.), *2018 European Conference on Object-Oriented Programming (ECOOP 2018);* Amsterdam, Netherlands, LIPIcs–Leibniz International Proceedings in Informatics, Vol. 109, ISBN 978-3-95977-079-8, pp. 16:1–16:29; July 2018. doi:10.4230/LIPIcs.ECOOP.2018.16 26 papers accepted out of 66 submissions = 39%

C.98 T. Park, J. Lettner, Y. Na, S. Volckaert and M. Franz; "Bytecode Corruption Attacks Are Real—And How To Defend Against Them;" in C. Giuffrida, S. Bardin, and G. Blanc (Eds)., *Detection of Intrusions and Malware, and Vulnerability Assessment (DIMVA 2018), 15th International Conference,* Saclay, France, Springer Lecture Notes in Computer Science Vol. 10885, ISBN 978-3-319-93410-5, pp. 326–348; June 2018. doi:10.1007/978-3-319-93411-2_15 18 papers accepted out of 59 submissions = 30%

C.97 P. Biswas, A. Di Federico, S.A. Carr, P. Rajasekaran, S. Volckaert, Y. Na, M. Franz, and M. Payer; "Venerable Variadic Vulnerabilities Vanquished;" in *USENIX Security 2017,* Vancouver, British Columbia, USENIX Association, ISBN 978-1-931971-40-9, pp. 186–198; August 2017. 85 papers accepted out of 522 submissions = 16%

C.96 S. Volckaert, B. Coppens, B. De Sutter, K. De Bosschere, P. Larsen, and M. Franz; "Taming Parallelism in a Multi-Variant Execution Environment;" in *EuroSys 2017,* Belgrade, Serbia, ISBN 978-1-4503-4938-3, pp. 270–285; April 2017. doi:10.1145/3064176.3064178 41 papers accepted out of 182 valid submissions = 22%

C.95 R. Rudd, R. Skowyra, D. Bigelow, V. Dedhia, Th. Hobson, S. Crane, Ch. Liebchen, P. Larsen, L. Davi, M. Franz, A.-R. Sadeghi, and H. Okhravi; "Address Oblivious Code Reuse: On the Effectiveness of Leakage Resilient Diversity;" in *2017 Network and Distributed System Security Symposium (NDSS 2017),* Internet Society, ISBN 1-891562-46-0, San Diego, California; February 2017. doi:10.14722/ndss.2017.23477 68 papers accepted out of 423 submissions = 16%

C.94 S. Volckaert, B. Coppens, A. Voulimeneas, A. Homescu, P. Larsen, B. De Sutter, and M. Franz; "Secure and Efficient Application Monitoring and Replication;" in *2016 USENIX Annual Technical Conference (ATC 2016),* Denver, Colorado, USENIX Association, ISBN 978-1-931971-30-0, pp. 167–179; June 2016. 47 papers accepted out of 266 submissions = 17.6%

C.93 J. Lettner, B. Kollenda, A. Homescu, P. Larsen, F. Schuster, L. Davi, A.-R. Sadeghi, T. Holz, and M. Franz; "Subversive-C: Abusing and Protecting Dynamic Message Dispatch;" in *2016 USENIX Annual Technical Conference (ATC 2016),* Denver, Colorado, USENIX Association, ISBN 978-1-931971-30-0, pp. 209–221; June 2016. 47 papers accepted out of 266 submissions = 17.6%

C.92 K. Braden, S. Crane, L. Davi, M. Franz, P. Larsen, Ch. Liebchen, and A.-R. Sadeghi; "Leakage-Resilient Layout Randomization for Mobile Devices;" in *2016 Network and Distributed System Security Symposium (NDSS 2016),* Internet Society, ISBN 1-891562-41-X, San Diego, California; February 2016. doi:10.14722/ndss.2016.23364 60 papers accepted out of 389 submissions = 15.4%

C.91 S. Crane, S. Volckaert, F. Schuster, Ch. Liebchen, P. Larsen, L. Davi, A.-R. Sadeghi, T. Holz, B. De Sutter, and M. Franz; "It's a TRAP: Table Randomization and Protection against Function Reuse Attacks;" in *22nd ACM Conference on Computer and Communications Security (CCS 2015),* Denver, Colorado, ACM Press, ISBN 978-1-4503-3832-5, pp. 243–255; October 2015. doi:10.1145/2810103.2813682 128 papers accepted out of 646 submissions = 19.4%

C.90 M. Conti, S. Crane, L. Davi, M. Franz, P. Larsen, Ch. Liebchen, M. Negro, M. Qunaibit, and A.-R. Sadeghi; "Losing Control: On the Effectiveness of Control-Flow Integrity under Stack Attacks;" in *22nd ACM Conference on Computer and Communications Security (CCS 2015),* Denver, Colorado, ACM Press, ISBN 978-1-4503-3832-5, pp. 952-963; October 2015. doi:10.1145/2810103.2813671 128 papers accepted out of 646 submissions = 19.4%

C.89 G. Savrun-Yeniceri, M. L. Van de Vanter, P. Larsen, S. Brunthaler, and M. Franz; "Efficient and Generic Event-based Profiler Framework for Dynamic Languages;" in *2015 International Conference on Principles and Practices of Programming on the Java platform: Virtual machines, Languages, and Tools (PPPJ'15),* Melbourne, Florida, ACM Press, ISBN 978-1-4503-3712-0, pp. 102–112; September 2015. doi:10.1145/2807426.2807435

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C.88 C. Stancu, Ch. Wimmer, S. Brunthaler, P. Larsen, and M. Franz; "Safe and Efficient Hybrid Memory Management for Java;" in *International Symposium on Memory Management 2015 (ISMM'15),* Portland, Oregon, ACM Press, ISBN 978-1-4503-3589-8, pp. 81-92; June 2015. doi:10.1145/2754169.2754185

C.87 S. Crane, Ch. Liebchen, A. Homescu, L. Davi, P. Larsen, A.-R. Sadeghi, S. Brunthaler, and M. Franz; "Readactor: Practical Code Randomization Resilient to Memory Disclosure;" in *36th IEEE Symposium on Security and Privacy,* San Jose, California; May 2015. doi:10.1109/SP.2015.52 55 papers accepted out of 407 submissions = 13.5%

C.86 S. Crane, A. Homescu, S. Brunthaler, P. Larsen, and M. Franz; "Thwarting Cache Side-Channel Attacks Through Dynamic Software Diversity;" in *2015 Network and Distributed System Security Symposium (NDSS 2015),* San Diego, California; February 2015. doi:10.14722/ndss.2015.23264 51 papers accepted out of 302 submissions = 16.9%

C.85 V. Mohan, P. Larsen, S. Brunthaler, K. Hamlen, and M. Franz; "Opaque Control-Flow Integrity;" in *2015 Network and Distributed System Security Symposium (NDSS 2015),* San Diego, California; February 2015. doi:10.14722/ndss.2015.23271 51 papers accepted out of 302 submissions = 16.9%

C.84 M. Murphy, P. Larsen, S. Brunthaler, and M. Franz; "Software Profiling Options and Their Effects on Security Based Code Diversification;" in *First ACM Workshop on Moving Target Defense (MTD 2014),* Scottsdale, Arizona, ACM Press, ISBN 978-1-4503-3150-0, pp. 87–96; November 2014. doi:10.1145/2663474.2663485

C.83 W. Zhang, P. Larsen, S. Brunthaler, and M. Franz; "Accelerating Iterators in Optimizing AST Interpreters;" in *2014 ACM International Conference on Object Oriented Programming Systems Languages & Applications (OOPSLA 2014),* Portland, Oregon, ACM Press, ISBN 978-1-4503-2585-1, pp. 727–743; October 2014. doi:10.1145/2660193.2660223 52 papers accepted out of 186 submissions = 28%

C.82 C. Stancu, Ch. Wimmer, S. Brunthaler, P. Larsen, and M. Franz; "Comparing Points-to Static Analysis with Runtime Recorded Profiling Data;" in *2014 International Conference on Principles and Practices of Programming on the Java platform: Virtual machines, Languages, and Tools (PPPJ 2014),* Cracow, Poland, ACM Press, ISBN 978-1-4503-2926-2, pp. 157–168; September 2014. doi:10.1145/2647508.2647524

C.81 P. Larsen, A. Homescu, S. Brunthaler, and M. Franz; "SoK: Automated Software Diversity;" in *35th IEEE Symposium on Security and Privacy,* San Jose, California, IEEE, ISBN 978-1-4799-4686-0, pp. 276-291; May 2014. doi:10.1109/SP.2014.25 44 papers accepted out of 334 submissions = 13%

C.80 Ch. Kerschbaumer, E. Hennigan, P. Larsen, S. Brunthaler, and M. Franz; "Information Flow Tracking meets Just-In-Time Compilation;" in *High Performance and Embedded Architecture and Compilation Conference (HiPEAC 2014),* Vienna, Austria; January 2014. doi:10.1145/2541228.2555295

C.79 Ch. Kerschbaumer, E. Hennigan, P. Larsen, S. Brunthaler, and M. Franz; "CrowdFlow: Efficient Information Flow Security;" *16th Information Security Conference (ISC 2013),* Dallas, Texas); November 2013. Springer Lecture Notes in Computer Science, Vol. 7807, ISBN 978-3-319-27658-8, pp. 321–340; December 2015. doi:10.1007/978-3-319-27659-5

C.78 A. Homescu, P. Larsen, S. Brunthaler, and M. Franz; "librando: Transparent Code Randomization for Just-in-Time Compilers;" in *20th ACM Conference on Computer and Communications Security (CCS 2013),* Berlin, Germany, ACM Press, ISBN 978-1-4503-2477-9, pp. 993–1004; November 2013. doi:10.1145/2508859.2516675 105 papers accepted out of 530 submissions = 19.8%

C.77 G. Savrun-Yeniceri, W. Zhang, H. Zhang, C. Li, S. Brunthaler, P. Larsen, and M. Franz; "Efficient Interpreter Optimizations for the JVM;" in *2014 International Conference on Principles and Practices of Programming on the Java platform: Virtual machines, Languages, and Tools (PPPJ'13),* Stuttgart, Germany, ACM Press, ISBN 978-1-4503-2111-2, pp. 113–123; September 2013. doi:10.1145/2500828.2500839

C.76 S. Crane, P. Larsen, S. Brunthaler, and M. Franz; "Booby Trapping Software;" in *2013 New Security Paradigms Workshop (NSPW 2013),* Banff, Canada, ACM Press, ISBN 978-1-4503-2582-0, pp. 95–106; September 2013. doi:10.1145/2535813.2535824

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C.75 E. Hennigan, Ch. Kerschbaumer, P. Larsen, S. Brunthaler, and M. Franz; "First-Class Labels: Using Information Flow to Debug Security Holes;" in M. Huth, N. Asokan, S. Capkun, I. Flechais, and L. Coles-Kemp (Eds.), *Trust and Trustworthy Computing, 6th International Conference (TRUST 2013),* London, United Kingdom, Springer Lecture Notes in Computer Science, Vol. 7904, ISBN 978-3-642-38907-8, pp. 151–168; June 2013. doi:10.1007/978-3-642-38908-5_12

C.74 Ch. Kerschbaumer, E. Hennigan, P. Larsen, S. Brunthaler, and M. Franz; "Towards Precise and Efficient Information Flow Control in Web Browsers;" in M. Huth, N. Asokan, S. Capkun, I. Flechais, and L. Coles-Kemp (Eds.), *Trust and Trustworthy Computing, 6th International Conference (TRUST 2013),* London, United Kingdom, Springer Lecture Notes in Computer Science, Vol. 7904, ISBN 978-3-642-38907-8, pp. 187–195; June 2013. doi:10.1007/978-3-642-38908-5_14

C.73 A. Homescu, S. Neisius, P. Larsen, S. Brunthaler, and M. Franz; "Profile-guided Automated Software Diversity," in *2013 IEEE/ACM International Symposium on Code Generation and Optimization (CGO 2013),* Shenzhen, China, IEEE, ISBN 978-1-4673-5524-7, pp. 204–214; February 2013. doi:10.1109/CGO.2013.6494997
33 papers accepted out of 117 submissions = 28%

C.72 A. Homescu, M. Stewart, P. Larsen, S. Brunthaler, and M. Franz; "Microgadgets: Size Does Matter In Turing-complete Return-oriented Programming," in *6th USENIX Workshop on Offensive Technologies (WOOT '12),* Bellevue, Washington; August 2012. https://www.usenix.org/system/files/conference/woot12/woot12-final9.pdf

C.71 Ch. Wimmer, S. Brunthaler, P. Larsen, and M. Franz; "Fine-Grained Modularity and Reuse of Virtual Machine Components;" in *11th Annual International Conference on Aspect-Oriented Software Development (AOSD '12),* Potsdam, Germany, ACM Press, ISBN 978-1-4503-1092-5, pp. 203–214; March 2012. doi:10.1145/2162049.2162073

C.70 M. Chang, B. Mathiske, E. Smith, A. Chaudhuri, M. Bebenita, A. Gal, Ch. Wimmer, and M. Franz; "The Impact of Optional Type Information on JIT Compilation Of Dynamically Typed Languages," in *7th Dynamic Languages Symposium (DLS 2011),* Portland, Oregon, ACM Press, ISBN 978-1-4503-0939-4, pp. 13–24; October 2011. doi:10.1145/2047849.2047853

C.69 G. Wagner, A. Gal, Ch. Wimmer, B. Eich, and M. Franz; "Compartmental Memory Management in a Modern Web Browser," in *International Symposium on Memory Management 2011 (ISMM'11),* San Jose, California, ACM Press, ISBN 978-1-4503-0263-0; June 2011. doi:10.1145/1993478.1993496

C.68 T. Jackson, B. Salamat, G. Wagner, Ch. Wimmer, and M. Franz; "On the Effectiveness of Multi-Variant Program Execution for Vulnerability Detection and Prevention;" in *6th International Workshop on Security Measurements and Metrics (MetriSec'10),* Bolzano-Bozen, Italy, ACM Press, ISBN 978-1-4503-0340-8, Article No. 7; September 2010. doi:10.1145/1853919.1853929

C.67 M. Franz; "E unibus pluram: Massive-Scale Software Diversity as a Defense Mechanism;" in *2010 Workshop on New Security Paradigms (NSPW'10),* Concord, Massachusetts, ACM Press, ISBN 978-1-4503-0415-3, pp. 7-16; September 2010. doi:10.1145/1900546.1900550

C.66 M. Bebenita, M. Chang, K. Manivannan, G. Wagner, M. Cintra, B. Mathiske, A. Gal, Ch. Wimmer, and M. Franz; "Trace-Based Compilation in Execution Environments without Interpreters;" in A. Krall, H. Mössenböck (Eds.), *8th International Conference on the Principles and Practice of Programming in Java 2010 (PPPJ'10),* Vienna, Austria, ACM Press, ISBN 978-1-4503-0269-2, pp. 59–68; September 2010. doi:10.1145/1852761.1852771

C.65 K. Manivannan, Ch. Wimmer, and M. Franz; "Decentralized Information Flow Control on a Bare-Metal JVM;" in *Sixth Annual Workshop on Cyber Security and Information Intelligence Research (CSIIRW'10),* Oak Ridge, Tennessee, ACM Press, ISBN 978-1-4503-0017-9; April 2010. doi:10.1145/1852666.1852738

C.64 T. Jackson, Ch. Wimmer, and M. Franz; "Multi-Variant Program Execution for Vulnerability Detection and Analysis;" in *Sixth Annual Workshop on Cyber Security and Information Intelligence Research (CSIIRW'10),* Oak Ridge, Tennessee, ACM Press, ISBN 978-1-4503-0017-9; April 2010. doi:10.1145/1852666.1852708

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C.63 Ch. Wimmer and M. Franz; "Linear Scan Register Allocation on SSA Form;" in *The Eighth International Symposium on Code Generation and Optimization (CGO 2010),* Toronto, Canada, ACM Press, ISBN 978-1-60558-635-9, pp. 170–179; April 2010. doi:10.1145/1772954.1772979

C.62 A. Yermolovich, Ch. Wimmer, and M. Franz; "Optimization of Dynamic Languages Using Hierarchical Layering of Virtual Machines;" in *5th Symposium on Dynamic Languages (DLS 2009)*, Orlando, Florida, ACM Press, ISBN 978-1-60558-769-1, pp. 79–88; October 2009. doi:10.1145/1640134.1640147 Awarded **"Most Notable Paper of DLS 2009"** (Test of Time Award) at DLS 2019.

C.61 Ch. Wimmer, M. Cintra, M. Bebenita, M. Chang, A. Gal, and M. Franz; "Phase Detection using Trace Compilation;" in *7th International Conference on the Principles and Practice of Programming in Java 2009 (PPPJ 2009),* Calgary, Alberta, ACM Press, ISBN 978-1-60558-598-7, pp. 172–181; August 2009. doi:10.1145/1596655.1596683

C.60 Ch. Kerschbaumer, G. Wagner, Ch. Wimmer, A. Gal, Ch. Steger, and M. Franz; "SlimVM: A Small Footprint Java Virtual Machine for Connected Embedded Systems;" in *7th International Conference on the Principles and Practice of Programming in Java 2009 (PPPJ 2009),* Calgary, Alberta, ACM Press, ISBN 978-1-60558-598-7, pp. 133–142; August 2009. doi:10.1145/1596655.1596678

C.59 M. Bebenita, M. Chang, A. Gal, and M. Franz; "Stream-Based Dynamic Compilation for Object-Oriented Languages;" in M. Oriol and B. Meyer (Eds.), *Objects, Components, Models and Patterns,* 47th International Conference (TOOLS-EUROPE 2009), Zurich, Switzerland, Springer Lecture Notes in Business Information Processing (LNBIP), Vol. 33, ISBN 978-3-642-02570-9, pp. 77–95; June 2009. doi:10.1007/978-3-642-02571-6_6

C.58 A. Gal, B. Eich, M. Shaver, D. Anderson, B. Kaplan, G. Hoare, D. Mandelin, B. Zbarsky, J. Orendorff, J. Ruderman, E. Smith, R. Reitmaier, M. R. Haghighat, M. Bebenita, M. Chang, and M. Franz; "Trace-based Just-in-Time Type Specialization for Dynamic Languages;" in *Programming Language Design and Implementation (PLDI 2009),* Dublin, Ireland, ACM Press, ISBN 978-1-60558-392-1, pp. 465–478; June 2009. doi:10.1145/1542476.1542528

C.57 B. Salamat, T. Jackson, A. Gal, and M. Franz; "Orchestra: Intrusion Detection Using Parallel Execution and Monitoring of Program Variants in User-Space;" in *EuroSys'09,* Nuremberg, Germany, ACM Press, ISBN 978-1-60558-482-9, pp. 33–46; April 2009. doi:10.1145/1519065.1519071

C.56 M. Franz; "Information-Flow Aware Virtual Machines: Foundations For Trustworthy Computing;" in *Cybersecurity Applications and Technologies Conference for Homeland Security (CATCH 2009),* Washington, D.C., IEEE Computer Society Publications, ISBN 978-0-7695-3568-5, pp. 91–96; March 2009. doi:10.1109/CATCH.2009.45

C.55 M. Chang, E. Smith, R. Reitmaier, A. Gal, M. Bebenita, Ch. Wimmer, B. Eich, and M. Franz; "Tracing for Web 3.0: Trace Compilation for the Next Generation Web Applications;" in *2009 ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments (VEE 2009),* Washington, D.C., ACM Press, ISBN 978-1-60558-375-4, pp. 71–80; March 2009. doi:10.1145/1508293.1508304

C.54 L. Wang and M. Franz; "Automatic Partitioning of Object-Oriented Programs for Resource-Constrained Mobile Devices with Multiple Distribution Objectives;" in *The 14th IEEE International Conference on Parallel and Distributed Systems (ICPADS'08),* Melbourne, Victoria, Australia, December 2008. doi:10.1109/ICPADS.2008.84

C.53 G. Wagner, A. Gal, and M. Franz; "SlimVM: Optimistic Partial Program Loading for Connected Embedded Java Virtual Machines;" in L. Veiga, V. Amaral, N. Horspool, and G. Cabri (Eds.), *Principles and Practice of Programming in Java 2008 (PPPJ 2008),* Proceedings of the 6th International Conference, Modena, Italy, ACM Press, ISBN 978-1-60558-223-8, pp. 117–126; September 2008. doi:10.1145/1411732.1411749 **(Best Paper Award)**

C.52 A. Yermolovich, A. Gal, and M. Franz; "Portable Execution of Legacy Binaries on the Java Virtual Machine;" in L. Veiga, V. Amaral, N. Horspool, and G. Cabri (Eds.), *Principles and Practice of Programming in Java 2008 (PPPJ 2008),* Proceedings of the 6th International Conference, Modena, Italy, ACM Press, ISBN 978-1-60558-223-8, pp. 63–72; September 2008. doi:10.1145/1411732.1411742

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C.51 A. Noll, A. Gal, and M. Franz; "CellVM: A Homogeneous Virtual Machine Runtime System for a Heterogeneous Single-Chip Multiprocessor;" in *2008 ISCA Workshop on Cell Systems and Applications,* Beijing, China; June 2008.

C.50 B. Salamat, A. Gal, and M. Franz; "Reverse Stack Execution in a Multi-Variant Execution Environment;" in *2008 DSN Workshop on Compiler and Architectural Techniques for Application Reliability and Security (CATARS'08),* Anchorage, Alaska; June 2008.

C.49 B. Salamat, A. Gal, T. Jackson, K. Manivannan, G. Wagner, and M. Franz; "Multi-Variant Program Execution: Using Multi-Core Systems to Defuse Buffer-Overflow Vulnerabilities;" in *2008 International Conference on Complex, Intelligent and Software Intensive Systems (CISIS 2008),* Barcelona, Spain, IEEE Computer Society Press, ISBN 978-0-7695-3109-0, pp. 843–848; March 2008. doi:10.1109/CISIS.2008.136

C.48 M. Franz; "Eliminating Trust From Application Programs By Way Of Software Architecture;" in *Software Engineering 2008 (SE 2008),* Munich, Germany, Lecture Notes in Informatics (LNI) No. 121, GI-Edition, Gesellschaft für Informatik, Bonn, ISBN 978-3-88579-215-4, pp. 112–126; February 2008.

C.47 M. Franz; "Understanding and Countering Insider Threats In Software Development;" in P. Kropf, M. Benyoucef, and H. Mili (Eds.), *2008 International Montreal Conference on e-Technologies (MCETECH 2008),* Montreal, Canada, IEEE Computer Society Publications, ISBN 978-0-7695-3082-6, pp. 81–90; January 2008. doi:10.1109/MCETECH.2008.32

C.46 D. Chandra and M. Franz; "Fine-Grained Information Flow Analysis and Enforcement in a Java Virtual Machine;" in *23rd Annual Computer Security Applications Conference (ACSAC 2007),* Miami Beach, Florida, IEEE Computer Society Publications, ISBN 0-7695-3060-5, pp. 463–474; December 2007. doi:10.1109/ACSAC.2007.37

C.45 M. Bebenita, A. Gal, and M. Franz; "Implementing Fast JVM Interpreters In Java Itself;" in V. Amaral, L. Veiga, L. Marcelino, and H. C. Cunningham (Eds.), *Principles and Practices of Programming in Java, Proceedings of the 5th International Conference (PPPJ 2007),* Lisbon, Portugal, ACM Press, ISBN 978-1-59593-672-1, pp. 145–154; September 2007. doi:10.1145/1294325.1294345

C.44 A. Gal, M. Bebenita, and M. Franz; "One Method At A Time Is Quite a Waste of Time;" in *Implementation, Compilation, Optimization of Object-Oriented Languages, Programs and Systems (ICOOOLPS'2007),* Berlin, Germany, Report No. 2007-5, Technische Universität Berlin, ISSN 1436-9915, pp. 11–16; July 2007.

C.43 M. Franz, A. Gal, and Ch.W. Probst; "Automatic Generation of Machine Emulators: Efficient Synthesis of Robust Virtual Machines for Legacy Software Migration;" in W.-G. Bleek, J. Raasch, H. Züllighoven (Eds.), *Software Engineering 2007 (SE 2007),* Hamburg, Germany, Lecture Notes in Informatics (LNI) No. 105, GI-Edition, Gesellschaft für Informatik, Bonn, ISBN 978-3-88579-199-7, pp. 83–94; March 2007.

C.42 A. Gal, Ch.W. Probst, and M. Franz; "HotpathVM: An Effective JIT Compiler for Resource-Constrained Devices;" in *Second International Conference on Virtual Execution Environments (VEE 2006),* Ottawa, Canada, ACM Press, ISBN 1-59593-332-6, pp. 144–153; June 2006. doi:10.1145/1134760.1134780

C.41 E. Yardimci and M. Franz; "Dynamic Parallelization of Binary Executables on Hierarchical Platforms;" in *Computing Frontiers 2006,* Ischia, Italy, ACM Press, ISBN 1-59593-302-6, pp. 127–138; May 2006. doi:10.1145/1128022.1128040

C.40 Ph. Adler, W. Amme, M. Franz, and J. von Ronne; "Producer-Side Platform-Independent Optimizations and Their Effects on Mobile-Code Performance;" in *The 10th IEEE Annual Workshop on Interaction between Compilers and Computer Architectures (INTERACT-10),* Austin, Texas; February 2006. 14 submitted, 8 accepted

C.39 V. Haldar, D. Chandra, and M. Franz; "Dynamic Taint Propagation for Java;" in *Twenty-First Annual Computer Security Applications Conference (ACSAC 2005),* Tucson, Arizona, IEEE Computer Society Publications, ISBN 0-7695-2461-3, pp. 274–282; December 2005. doi:10.1109/CSAC.2005.21

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C.38 V. Haldar, D. Chandra, and M. Franz; "Practical, Dynamic Information-Flow for Virtual Machines;" in *2nd International Workshop on Programming Language Interference and Dependence (PLID'05),* London, England; September 2005.

C.37 A. Gal, Ch.W. Probst, and M. Franz; "Average Case vs. Worst Case Margins of Safety in System Design;" in Ch. F. Hempelmann, V. Raskin (Eds.), *New Security Paradigms Workshop 2005 (NSPW 2005),* Lake Arrowhead, California, ACM Press, ISBN 1-59593-317-4, pp. 25–32; September 2005. doi:10.1145/1146269.1146279

C*.36 A. Gal, Ch.W. Probst, and M. Franz; "Structural Encoding of Static Single Assignment Form;" in *4th International Workshop on Compiler Optimization Meets Compiler Verification (COCV'05),* Edinburgh, Scotland; April 2005. Revised post-conference version published as *Electronic Notes in Theoretical Computer Science (ENTCS),* Vol. 141, No. 2, pp. 85–102; November 2005. doi:10.1016/j.entcs.2005.02.045

C*.35 W. Amme, J. von Ronne, and M. Franz; "Quantifying the Benefits of SSA-Based Mobile Code;" in *4th International Workshop on Compiler Optimization Meets Compiler Verification (COCV'05),* Edinburgh, Scotland; April 2005. Revised post-conference version published as *Electronic Notes in Theoretical Computer Science (ENTCS),* Vol. 141, No. 2, pp. 103–119; November 2005. doi:10.1016/j.entcs.2005.02.046

C*.34 A. Gal, Ch.W. Probst, and M. Franz; "Integrated Java Bytecode Verification;" in *First International Workshop on Abstract Interpretation of Object-Oriented Programming Languages (AIOOL'05),* Paris, France; January 2005. Also published as *Electronic Notes in Theoretical Computer Science (ENTCS),* Vol. 131, pp. 27–38; May 2005. doi:10.1016/j.entcs.2005.01.020

C.33 V. Haldar and M. Franz; "Symmetric Behavior-Based Trust: A New Paradigm for Internet Computing;" in Carla Marceau, Simon Foley (Eds.), *New Security Paradigms Workshop 2004 (NSPW 2004),* White Point, Nova Scotia, ACM Press, ISBN 1-59593-076-0, pp. 79–84; September 2004. doi:10.1145/1065907.1066039 (This paper was one of 4 papers selected for the "Highlights of NSPW 2004" session at *ACSAC 2004*.)

C.32 J. von Ronne, N. Wang, and M. Franz; 'Interpreting Programs in Static Single Assignment Form;" in *ACM SIGPLAN 2004 Workshop on Interpreters, Virtual Machines and Emulators (IVME'04),* Washington, D.C., pp. 23–30; June 2004. doi:10.1145/1059579.1059585

C.31 M. Beers, Ch.H. Stork, and M. Franz; "Efficiently Verifiable Escape Analysis;" in M. Odersky (Ed.), *18th European Conference on Object-Oriented Programming (ECOOP 2004),* Oslo, Norway, Springer Lecture Notes in Computer Science, Vol. 3086, ISBN 3-540-22159-X, pp. 75–95; June 2004. doi:10.1007/b98195

C.30 V. Haldar, D. Chandra, and M. Franz; "Semantic Remote Attestation: A Virtual Machine Directed Approach to Trusted Computing;" in *3rd USENIX Virtual Machine Research & Technology Symposium (VM'04),* San Jose, California, ISBN 1-931971-20-X, pp. 29–41; May 2004. (**Best Paper Award**)

C.29 Ch.W. Probst, A. Gal, and M. Franz; "Code Generating Routers: A Network-Centric Approach to Mobile Code;" in *2003 IEEE 18th Annual Workshop on Computer Communications (CCW'2003),* Dana Point, California, IEEE Press, ISBN 0-7803-8239-0, pp. 179–186; October 2003.

C.28 M. Franz, D. Chandra, A. Gal, V. Haldar, F. Reig, and N. Wang; "A Portable Virtual Machine Target For Proof-Carrying Code;" in *ACM SIGPLAN 2003 Workshop on Interpreters, Virtual Machines and Emulators (IVME'03),* San Diego, California, pp. 24–31; June 2003. doi:10.1145/858570.858573

C.27 J. von Ronne, A. Hartmann, W. Amme, and M. Franz; "Code Annotation for Safe and Efficient Dynamic Object Resolution;" in *2003 Workshop on Compiler Optimization meets Compiler Verification (COCV 2003),* Warsaw, Poland, April 2003. doi:10.1016/S1571-0661(05)82597-6

C.26 A. Gal, M. Franz, and D. Beuche, "Learning from Components: Fitting AOP for System Software;" in *Second AOSD 2003 Workshop on Aspects, Components, and Patterns for Infrastructure Software (ACP4IS'2003),* Boston, Massachusetts; March 2003.

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C.25 V. Haldar, Ch.H. Stork, and M. Franz; "The Source Is The Proof;" in C. Serban, S. Saydjari (Eds.), in *ACM SIGSAC 2002 Workshop on New Security Paradigms (NSPW 2002),* Virginia Beach, Virginia, ACM Press, ISBN 1-58113-598-X, pp. 69–73; September 2002. doi:10.1145/844102.844114 (This paper was one of 4 papers selected for the "Best of NSPW 2002" session at ACSAC 2002.)

C.24 V. Haldar and M. Franz; "Towards Trusted Systems, From The Ground Up;" in *Tenth ACM SIGOPS European Workshop: Can We Really Depend On An OS? (EW 2002),* Saint-Emilion, France, ACM Press, pp. 251–254; September 2002. doi:10.1145/1133373.1133426

C.23 M. Franz; "Enhancing Class Files: A Migration Path to Better Mobile-Code Representations;" in D. Bakken (Ed.), *DSN Fast Abstracts, International Conference on Dependable Systems and Networks (DSN 2002),* Washington, D.C., June 2002.

C.22 J. von Ronne, A. Hartmann, W. Amme, and M. Franz; "Efficient Online Optimization by Utilizing Offline Analysis and the SafeTSA Representation;" in *Proceedings of the 2nd Workshop on Intermediate Representation Engineering for Virtual Machines (IRE 2002),* Dublin, Ireland, June 2002.

C.21 D. Chandra, Ch. Fensch, W.-K. Hong, L. Wang, E. Yardimci, and M. Franz; "Code Generation at the Proxy: An Infrastructure-Based Approach to Ubiquitous Mobile Code;" in *Fifth ECOOP Workshop on Object-Orientation and Operating Systems (ECOOP-OOOSWS 2002),* Málaga, Spain, June 2002.

C.20 A. Gal, P.H. Fröhlich, and M. Franz; "An Efficient Execution Model for Dynamically Reconfigurable Component Software;" in *7th International Workshop on Component-Oriented Programming (WCOP 2002),* Málaga, Spain, June 2002.

C.19 P.H. Fröhlich and M. Franz; "On Certain Basic Properties of Component-Oriented Programming Languages;" in *First OOPSLA Workshop on Language Mechanisms for Programming Software Components,* Tampa Bay, Florida; October 2001.

C.18 M. Franz; "A Fresh Look At Low-Power Mobile Computing;" in *Compilers and Operating Systems for Low Power 2001 (COLP 01),* Barcelona, Spain, pp. 15.1–15.6; September 2001.

C*.17 Ch.H. Stork, P. S. Housel, V. Haldar, N. Dalton, and M. Franz; "Towards Language Agnostic Mobile Code;" in N. Benton and A. Kennedy (Eds.), *First Workshop on Multi-Language Infrastructure and Interoperability (BABEL'01),* Florence, Italy; September 2001. Also published as *Electronic Notes in Theoretical Computer Science (ENTCS),* Vol. 59, No. 1, pp. 142–157; November 2001. doi:10.1016/S1571-0661(05)80458-X

C.16 W. Amme, N. Dalton, J. von Ronne, and M. Franz; "SafeTSA: A Type Safe and Referentially Secure Mobile-Code Representation Based on Static Single Assignment Form;" in *ACM Sigplan Conference on Programming Language Design and Implementation (PLDI 2001),* Snowbird, Utah, pp. 137–147; June 2001. doi:10.1145/378795.378825

C.15 W. Amme, N. Dalton, P.H. Fröhlich, V. Haldar, P. S. Housel, J. von Ronne, Ch.H. Stork, S. Zhenochin, and M. Franz; "Project transPROse: Reconciling Mobile-Code Security With Execution Efficiency;" in *The Second DARPA Information Survivability Conference and Exhibition (DISCEX II),* Anaheim, California; IEEE Computer Society Press, ISBN 0-7695-1212-7, pp. II.196–II.210; June 2001. doi:10.1109/DISCEX.2001.932172

C.14 W. Amme, N. Dalton, M. Franz, and J. von Ronne; "A Type-Safe Mobile Code Representation Aimed At Supporting Dynamic Optimization At The Target Site;" in *Third ACM Workshop on Feedback-Directed and Dynamic Optimization (FDDO-3),* Monterey, California, December 2000. (**Best Paper Award**; additionally and independently, the paper's presentation was one of three simultaneous winners of the **Best Presentation Award**.)

C.13 P.H. Fröhlich and M. Franz; "Stand-Alone Messages: A Step Towards Component-Oriented Programming Languages;" in J. Gutknecht and W. Weck (Eds.), *Modular Programming Languages: Proceedings of the Fifth Joint Modular Languages Conference (JMLC 2000),* Zurich, Switzerland; Springer Lecture Notes in Computer Science, No. 1891, ISBN 3-540-67958-8, pp. 90–103; September 2000. doi:10.1007/10722581_9

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C.12 M. Franz, P.H. Fröhlich, and T. Kistler; "Towards Language Support for Component-Oriented Real-Time Programming;" in *The Fifth IEEE International Workshop on Object-Oriented Real-Time Dependable Systems (WORDS'99F),* Monterey, California, November 1999; IEEE Computer Society Press, ISBN 0-7695-0616-X; April 2000. doi:10.1109/WORDSF.1999.842343

C.11 T. Kistler and M. Franz; "Computing the Similarity of Profiling Data: Heuristics for Guiding Adaptive Optimizations;" in *Proceedings of the Workshop on Profile and Feedback-Directed Optimization,* Paris, France, October 1998.

C.10 M. Franz; "On the Architecture of Software Component Systems;" in R.N. Horspool (Ed.), *Systems Implementation 2000, (Proceedings of the IFIP TC2 WG2.4 Working Conference on Systems Implementation 2000: Languages, Methods and Tools, Berlin, Germany),* Chapman & Hall, ISBN 0-412-83530-4, pp. 207–220; February 1998.

C.09 M. Franz and T. Kistler; "Does Java Have Alternatives?;" in D.J. Richardson and D. Wile (Eds.), *Proceedings of the Third California Software Symposium (CSS'97),* Irvine, California, pp. 5–10; November 1997.

C.08 M. Franz; "Beyond Java: An Infrastructure for High-Performance Mobile Code on the World Wide Web;" in S. Lobodzinski and I. Tomek (Eds.), *Proceedings of WebNet 97,* World Conference of the WWW, Internet, and Intranet, Association for the Advancement of Computing in Education; ISBN 1-880094-27-4, pp. 33–38; October 1997. (**Best Paper Award**)

C.07 M. Franz; "Run-Time Code Generation as a Central System Service;" in The Sixth Workshop on Hot Topics in Operating Systems (HotOS VI), IEEE Computer Society Press, ISBN 0-8186-7834-8, pp. 112–117; May 1997. doi:10.1109/HOTOS.1997.595192

C.06 M. Franz; "Toward an Execution Model for Component Software;" in Proceedings of the First International Workshop on Component-Oriented Programming (WCOP 1996), subsequently published as M. Mühlhäuser (Ed.), *Special Issues in Object-Oriented Programming: Workshop Reader of the 10th European Conference on Object-Oriented Programming (ECOOP'96),* dpunkt Verlag, Heidelberg, ISBN 3-920993-67-5, pp. 144–149; March 1997.

C.05 T. Kistler and M. Franz; "A Tree-Based Alternative to Java Byte-Codes;" in *Proceedings of the International Workshop on Security and Efficiency Aspects of Java,* Eilat, Israel; January 1997.

C.04 M. Franz; "Compiler Optimizations Should Pay for Themselves;" in P. Schulthess (Ed.), *Advances in Modular Languages: Proceedings of the Joint Modular Languages Conference,* Universitätsverlag Ulm, ISBN 3-89559-220-X, pp. 111–121; September 1994.

C.03 M. Franz; "Technological Steps toward a Software Component Industry;" in J. Gutknecht (Ed.), *Programming Languages and System Architectures: Proceedings of the International Conference,* Zurich, Switzerland, Springer Lecture Notes in Computer Science, No. 782, pp. 259–281; March 1994. doi:10.1007/3-540-57840-4_36

C.02 M. Franz; "Immediate Object-Level Software Reuse on Different Target Architectures using Fast On-The-Fly Code Generation;" in *Position Paper Collection of the Second International Workshop on Software Reusability,* Lucca, Italy; March 1993.

C.01 M. Franz and S. Ludwig; "Portability Redefined;" in *Proceedings of the Second International Modula-2 Conference,* Loughborough, England, pp. 216–224; September 1991.

Selected Further Conferences, Workshops, and Other Publications

*Note: Technical reports that have subsequently been published as book chapters, conference papers, or journal articles are **not** listed again here.*

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CPC04 E. Yardimci, N. Dalton, Ch. Fensch, and M. Franz; "Azure: A Virtual Machine for Improving Execution of Sequential Programs on Throughput-Oriented Explicitly-Parallel Processors;" in *Proceedings of the 11th International Workshop on Compilers for Parallel Computers (CPC 2004),* Seeon, Germany, Shaker Verlag, pp. 61–174; July 2004.

PLOS04 A. Gal, Ch.W. Probst, and M. Franz; "Executing Legacy Applications on a Java Operating System;" in *Proceedings of the ECOOP Workshop on Programming Languages and Operating Systems 2004 (ECOOP-PLOS 2004),* Oslo, Norway; June 2004.

TR.04-09 A. Gal, Ch.W. Probst, and M. Franz; *Complexity-Based Denial of Service Attacks on Mobile-Code Systems*; Technical Report No. 04-09, School of Information and Computer Science, University of California, Irvine; April 2004.

CPC03 N. Dalton, Ch. Fensch, E. Yardimci, and M. Franz; "A Virtual Machine for Improving Native-Code Execution on Explicitly Parallel Processors;" in *Proceedings of the 10th International Workshop on Compilers for Parallel Computers (CPC 2003),* Amsterdam, The Netherlands, pp. 261–270; January 2003.

CPC01 J. von Ronne, M. Franz, N. Dalton, and W. Amme; "Compile Time Elimination of Null- and Bounds-Checks;" in *Ninth International Workshop on Compilers for Parallel Computers (CPC 2001),* Edinburgh, Scotland, pp. 325–334; June 2001.

TR.98-34 M. Franz and T. Kistler; *Splitting Data Objects to Increase Cache Latency*; Technical Report No. 98-34, Department of Information and Computer Science, University of California, Irvine; October 1998.

TR.90-142 M. Franz; *MacOberon Reference Manual*; Technical Report No. 142, Departement Informatik, ETH Zürich; November 1990.

TR.90-141 M. Franz; *The Implementation of MacOberon*; Technical Report No. 141, Departement Informatik, ETH Zürich; October 1990.

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Professional Activities

Major Honors and Awards

- I have been awarded a *European Research Council (ERC) Advanced Grant (ADG)* of €2.5 Million, a lump-sum grant for a five year period starting July 2026. ERC ADGs are "awarded to exceptional leaders in terms of originality and significance of their research contributions" and "give senior researchers the opportunity to pursue ambitious, curiosity-driven projects that could lead to major scientific breakthroughs;" 2025.
- *ACM Charles P. "Chuck" Thacker Breakthrough in Computing Award, Association for Computing Machinery (ACM),* "for the development of just-in-time compilation techniques that enabled fast and feature-rich web services on the internet." This award of $100,000 recognizes "individuals who have made a surprising or disruptive leapfrog in computing ideas or technologies;" 2020.
- *Fellow, American Association for the Advancement of Science (AAAS),* 'for distinguished contributions to computer science, particularly to the areas of just-in-time compilation and optimization and techniques for computer security;" 2019.
- *Inaugural Fellow, International Federation for Information Processing (IFIP).* Among the inaugural cohort of only 18 inductees when the Fellow grade was first introduced. The Fellow Award recognizes individuals of the highest professional standing and expertise in one of IFIP's constituent societies who have also contributed directly to IFIP. Established in 1960 under the auspices of UNESCO, IFIP is the global organisation for researchers and professionals working in the field of information and communication technologies. IFIP is recognised by the United Nations and links some 50 national and international societies and academies of science with a total membership of over half a million professionals. 2019.
- *Humboldt Research Award*, Alexander von Humboldt Foundation. This award is granted in recognition of a researcher's entire achievements to date to academics whose fundamental discoveries, new theories, or insights have had a significant impact on their own discipline and who are expected to continue producing cutting-edge achievements in the future. Award of €60,000; 2018.
- *Innovator of the Year Award, UCI Applied Innovation & The Beall Family Foundation),* Award of $10,000; 2018.
- *Fellow, Association for Computing Machinery (ACM),* "for contributions to just-in-time compilation and optimization and to compiler techniques for computer security;" 2015.
- *Fellow, The Institute of Electrical and Electronics Engineers (IEEE),* "for contributions to just-in-time compilation and to computer security through compiler-generated software diversity;" 2015.
- *Dean's Award for Research*, Donald Bren School of Information and Computer Sciences, UC Irvine, 2015.
- *IEEE Computer Society Technical Achievement Award*, 2012, "for pioneering contributions to just-in-time compilation and optimization and significantly advancing Web application technology."
- *IEEE Orange County Chapter Outstanding Engineer Award*, 2012.
- *University of California, Irvine, Distinguished Mid-Career Faculty Award for Research*, 2010. This is the Academic Senate's highest honor for research. One such award at most is given yearly to an Assistant Professor, one to an Associate or Full Professor Step I-IV (the "Mid-Career Award"), and one to a Professor Step V or higher.
- *Distinguished Scientist, Association for Computing Machinery (ACM),* "Created early mobile code system. Leads key research group on Virtual Machines and Mobile-Code Security. Co-Founder of the ACM Sigplan VEE Conference;" 2006.
- *Senior Member, The Institute of Electrical and Electronics Engineers (IEEE),* 2006.
- *National Science Foundation CAREER Award,* 1997.
- I was awarded a *Fulbright Scholarship* (for graduate study in the United States) in 1989, but subsequently declined this award in order to join the research group of Prof. Niklaus Wirth at ETH Zürich.

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Service to the Professional Community: Ongoing

- Program Committee Member, Software Security Track, *33rd ACM Conference on Computer and Communications Security (ACM CCS 2026),* The Hague, Netherlands; November 2026.
- Program Committee Member, *2026 IEEE Secure Development Conference (SecDev 2026 Research),* Montreal, Quebec, Canada; July 2026.
- Member, *IFIP Working Group 11.10 ("Critical Infrastructure Protection"),* 2018 – present.
- Journal Editorial Board Member, *Software—Practice and Experience (SPE);* since July 2010.
- Emeritus Member, *IFIP Working Group 2.4 ("Software Implementation Technology"),* since July 2018 (previously, I was a Full Voting Member from 2002 – 2018, and before that, an Observer from 1998 – 2002).
- Charter Faculty Member, *Security Computing and Networking Center (SCoNCe)* (previously named *Center for Cyber-Security and Privacy*), Donald Bren School of Information and Computer Sciences, UC Irvine, May 2005 – present.
- Charter Member, *The California Institute for Telecommunications and Information Technology (Cal-(IT)^2),* one of four California Institutes for Science and Technology, December 2000 – present.

Service to the Professional Community: Past

Editorial Board Member

- Journal Editorial Board Member, *Software-Intensive Cyber-Physical Systems (SICS);* October 2009–December 2020. Prior to 2017, the journal was published under the name *Computer Science—Research and Development (CSRD).*
- Journal Editorial Board Member, *IEEE Transactions on Dependable and Secure Computing (TDSC);* March 2015–December 2019. (IEEE Computer Society policy limits the service of Associate Editors to two consecutive 2-year terms.)

Program Committee Member

- *2025 IEEE Secure Development Conference (SecDev 2025 Research),* Indianapolis, Indiana; October 2025.
- *2025 OOPSLA: Conference on Object-Oriented Programming Systems, Languages, and Applications (OOPSLA 2025),* Singapore; October 2025.
- *First Workshop on Software Understanding and Reverse Engineering (SURE 2025),* Taipei, Taiwan; October 2025.
- *2024 IEEE Secure Development Conference (SecDev 2024 Research),* Pittsburgh, Pennsylvania; October 2024.
- *2023 IEEE Symposium on Security and Privacy ("Oakland"),* San Francisco, California; May 2023.
- *2022 USENIX Security Conference,* Boston, Massachusetts; August 2022.
- *2022 Network and Distributed System Security Symposium (NDSS),* San Diego, California, April 2022.
- *24th International Symposium on Research in Attacks, Intrusions and Defenses (RAID 2021),* Donostia / San Sebastian, Spain; October 2021.
- *26th European Symposium on Research in Computer Security (ESORICS 2021),* Darmstadt, Germany; October 2021.
- *2021 USENIX Security Conference,* Vancouver, British Columbia; August 2021.
- *2021 IEEE Symposium on Security and Privacy ("Oakland"),* San Francisco, California; May 2021.
- *18th International Conference on Cryptology and Network Security (CANS 2020),* Vienna, Austria; December 2020.

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- *27th ACM Conference on Computer and Communications Security (ACM CCS 2020),* Orlando, Florida; November 2020.
- *5th Workshop on Forming an Ecosystem Around Software Transformation (FEAST 2020),* Orlando, Florida; November 2020.
- *4th Workshop on Attacks and Solutions in Hardware Security (ASHES 2020),* Orlando, Florida; November 2020.
- *7th ACM Workshop on Moving Target Defense (MTD 2020),* Orlando, Florida; November 2020.
- *2020 IEEE Symposium on Security and Privacy ("Oakland"),* San Francisco, California; May 2020.
- *GI SICHERHEIT 2020,* Göttingen, Germany; March 2020.
- *6th ACM Workshop on Moving Target Defense (MTD 2019),* London, England; November 2019.
- *3rd International Workshop on Software Protection (SPRO-2019),* London, England; November 2019.
- *26th ACM Conference on Computer and Communications Security (ACM CCS 2019),* London, England; November 2019.
- *2019 IEEE Symposium on Security and Privacy ("Oakland"),* San Francisco, California; May 2019.
- *2018 Dynamic Languages Symposium (DLS18),* Boston, Massachusetts; November 2018.
- *25th ACM Conference on Computer and Communications Security (ACM CCS 2018),* Toronto, Ontario, Canada; October 2018.
- *5th ACM Workshop on Moving Target Defense (MTD 2018),* Toronto, Ontario, Canada; October 2018.
- *2018 Secure Development Conference (SecDev 2018),* Cambridge, Massachusetts, September/October 2018.
- *19th World Conference on Information Security Applications (WISA 2018),* Jeju Island, South Korea; August 2018.
- *First Workshop on Software Debloating and Delayering (SALAD '18),* Amsterdam, Netherlands; July 2018.
- *38th IEEE International Conference on Distributed Computing Systems (ICDCS 2018),* Vienna, Austria; June 2018.
- *GI SICHERHEIT 2018,* Constance, Germany; April 2018.
- *2017 ACM/IFIP/USENIX International Middleware Conference (Middleware 2017),* Las Vegas, Nevada; December 2017.
- *4th ACM Workshop on Moving Target Defense (MTD 2017),* Dallas, Texas; October 2017.
- *2017 Secure Development Conference (SecDev 2017),* Cambridge, Massachusetts, September 2017.
- *International Symposium on Engineering Secure Software and Systems (ESSoS'17),* Bonn, Germany; July 2017.
- *15th International Conference on Applied Cryptography and Network Security (ACNS 2017),* Kanazawa, Japan; July 2017.
- *37th IEEE International Conference on Distributed Computing Systems (ICDCS 2017),* Atlanta, Georgia; June 2017.
- *2017 ACM Asia Conference on Computer and Communications Security (ASIACCS 2017),* Abu Dhabi, UAE; April 2017.
- *8th IEEE International Workshop on Information Forensics and Security (WIFS 2016),* Abu Dhabi, UAE; December 2016.
- *3rd ACM Workshop on Moving Target Defense (MTD 2016),* Vienna, Austria; October 2016.
- *2nd International Workshop on Software Protection (SPRO-2016),* Vienna, Austria; October 2016.
- *23rd ACM Conference on Computer and Communications Security (ACM CCS 2016),* Vienna, Austria; October 2016.
- *2016 International Conference on Principles and Practices of Programming in Java (PPPJ'2016),* Lugano, Switzerland; September 2016.

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- **Program co-Chair**, *9th International Conference on Trust and Trustworthy Computing (TRUST 2016),* Vienna, Austria; August 2016.
- *14th International Conference on Applied Cryptography and Network Security (ACNS 2016),* London, United Kingdom; June 2016.
- *International Symposium on Engineering Secure Software and Systems (ESSoS'16),* Egham, United Kingdom; March 2016.
- *First IEEE European Symposium on Security and Privacy 2016 (EuroS&P2016),* Saarbrücken, Germany; March 2016.
- *2nd ACM Workshop on Moving Target Defense (MTD 2015),* Denver, Colorado; October 2015.
- *22nd ACM Conference on Computer and Communications Security (CCS 2015),* Denver, Colorado; October 2015.
- *2015 International Conference on Principles and Practices of Programming in Java (PPPJ'2015),* Melbourne, Florida; September 2015.
- *8th International Conference on Trust and Trustworthy Computing (TRUST 2015),* Heraklion, Greece; August 2015.
- *1st International Workshop on Software Protection (SPRO-2015),* Florence, Italy; May 2015.
- *IEEE Workshop on Web 2.0 Security and Privacy 2015 (W2SP'2015),* San Jose, California; May 2015.
- *International Symposium on Engineering Secure Software and Systems (ESSoS'15),* Milan, Italy; March 2015.
- *First ACM Workshop on Moving Target Defense (MTD 2014),* Scottsdale, Arizona; November 2014.
- *2014 New Security Paradigms Workshop (NSPW 2014),* Victoria, British Columbia, Canada; September 2014.
- *2014 International Conference on Principles and Practices of Programming in Java (PPPJ'2014),* Krakow, Poland; September 2014.
- *IEEE Workshop on Web 2.0 Security and Privacy 2014 (W2SP'2014),* San Francisco, California; May 2014.
- *ACM International Conference on Computing Frontiers 2014 (CF 14),* Cagliari, Italy; May 2014.
- *The Next Generation Malware Attacks and Defense Workshop (NGMAD),* New Orleans, Louisiana; December 2013.
- *2013 International Conference on Principles and Practices of Programming in Java (PPPJ'2013),* Stuttgart, Germany; September 2013.
- *2013 New Security Paradigms Workshop (NSPW 2013),* Banff, Alberta, Canada; September 2013.
- *6th International Conference on Trust and Trustworthy Computing (TRUST 2013),* London, United Kingdom; June 2013.
- *28th Annual Computer Security Applications Conference (ACSAC 2012),* Orlando, Florida; December 2012.
- *2012 New Security Paradigms Workshop (NSPW 2012),* Bertinoro, Italy; September 2012.
- *11th International Conference on Generative Programming and Component Engineering (GPCE 2012),* Dresden, Germany; September 2012.
- *2012 IEEE International Conference on Privacy, Security, Risk and Trust (PASSAT 2012),* Amsterdam, The Netherlands; September 2012.
- *5th International Conference on Trust and Trustworthy Computing (TRUST 2012),* Vienna, Austria; June 2012.
- *Eighth ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments (VEE 2012),* London, United Kingdom; March 2012.
- *27th Annual Computer Security Applications Conference (ACSAC 2011),* Orlando, Florida; December 2011.
- **Program co-Chair**, *International Workshop on Programming Language And Systems Technologies for Internet Clients (PLASTIC 2011),* Portland, Oregon; October 2011.

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- *6th Workshop on Programming Languages and Operating Systems (PLOS 2011),* Cascais, Portugal; October 2011.
- *Third IEEE International Conference on Privacy, Security, Risk and Trust (PASSAT2011),* Boston, Massachusetts; October 2011.
- *2011 New Security Paradigms Workshop (NSPW 2011),* Sonoma, California; September 2011.
- *4th International Conference on Trust and Trustworthy Computing (TRUST 2011),* Pittsburgh, Pennsylvania; June 2011.
- *ACM Sigplan Conference on Programming Language Design and Implementation (PLDI 2011),* San Diego, California; June 2011.
- *5th International Multidisciplinary Conference on e-Technologies (MCETECH 2011),* Les Diablerets, Switzerland; January 2011.
- **Program Chair**, *26th Annual Computer Security Applications Conference (ACSAC 2010),* Austin, Texas; December 2010. 237 submitted papers, 39 accepted.
- *19th ACM/IEEE/IFIP International Conference on Parallel Architectures and Compilation Techniques (PACT 2010),* Vienna, Austria; September 2010.
- *2010 IEEE International Conference on Privacy, Security, Risk and Trust (PASSAT-10),* Minneapolis, Minnesota; August 2010.
- *ACM SIGPLAN/SIGBED Conference on Languages, Compilers and Tools for Embedded Systems (LCTES 2010),* Stockholm, Sweden; April 2010.
- *ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments (VEE 2010),* Pittsburgh, Pennsylvania; March 2010.
- *International Symposium on Engineering Secure Software and Systems (ESSoS 2010),* Pisa, Italy; February 2010.
- **Program co-Chair**, *25th Annual Computer Security Applications Conference (ACSAC 2009),* Honolulu, Hawaii; December 2009.
- *12th Information Security Conference (ISC 2009),* Pisa, Italy; September 2009.
- *2009 New Security Paradigms Workshop (NSPW 2009),* Oxford, United Kingdom; September 2009.
- *2009 IEEE International Conference on Privacy, Security, Risk and Trust (PASSAT-09),* Vancouver, British Columbia, Canada; August 2009.
- *2009 International Conference on Principles and Practices of Programming in Java (PPPJ'2009),* Calgary, Alberta, Canada; August 2009.
- *47th International Conference on Objects, Models, Components, and Patterns (TOOLS-EUROPE 2009),* Zurich, Switzerland, June/July 2009.
- *4th Montreal Conference on eTechnologies (MCETECH),* Ottawa, Canada; May 2009.
- *Compiler Construction 2009 (CC 2009),* York, United Kingdom; March 2009.
- *2008 IEEE Symposium on Security and Privacy,* Oakland, California; May 2008.
- *2008 Annual IEEE Computer Society/ACM International Symposium on Code Generation and Optimization (CGO 2008),* Boston, Massachusetts; March 2008.
- *23rd Annual Computer Security Applications Conference (ACSAC 2007),* Miami Beach, Florida; December 2007.
- *2007 International Conference on Principles and Practices of Programming in Java (PPPJ'2007),* Monte de Caparica/Lisbon, Portugal; September 2007.
- *New Security Paradigms Workshop (NSPW 2007),* Washington Valley, New Hampshire; September 2007.
- *Workshop on Linguistic Support for Modern Operating Systems (PLOS 2006),* October 2006.
- *The Second Workshop on Advances in Trusted Computing (WATC'06 Fall),* Tokyo, Japan, November-December 2006.

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- *Seventh Joint Modular Languages Conference (JMLC 2006),* Oxford, United Kingdom, September 2006.
- *2006 International Conference on Principles and Practices of Programming in Java (PPPJ'2006),* Mannheim, Germany, September 2006.
- *New Security Paradigms Workshop (NSPW 2006),* Dagstuhl, Germany, September 2006.
- *New Security Paradigms Workshop (NSPW 2005),* Lake Arrowhead, California, September 2005.
- *ECOOP Workshop on Programming Languages and Operating Systems (ECOOP-PLOS 2005),* June 2005.
- *Third International Workshop on Compiler Optimization Meets Compiler Verification (COCV 2005),* Edinburgh, Scotland, April 2005.
- *3. Arbeitstagung Programmiersprachen (ATPS 2004) of the German Computer Society (GI),* Ulm, Germany, September 2004.
- *ECOOP Workshop on Programming Languages and Operating Systems (ECOOP-PLOS 2004),* Oslo, Norway, June 2004.
- *ACM SIGPLAN 2004 Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES'04),* Washington, D.C., June 2004.
- *Second Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO 2004),* San Jose, California, March 2004.
- *Third International Workshop on Compiler Optimization Meets Compiler Verification (COCV 2004),* Barcelona, Spain, March/April 2004.
- *ACM SIGSAC New Security Paradigms Workshop 2003 (NSPW-2003),* Ascona, Switzerland, September 2003.
- *Sixth Joint Modular Languages Conference (JMLC 2003),* Klagenfurt, Austria, August 2003.
- *ACM SIGPLAN 2003 Workshop on Interpreters, Virtual Machines and Emulators (IVME'03),* San Diego, California, June 2003.
- *Second International Workshop on Compiler Optimization Meets Compiler Verification (COCV 2003),* Warsaw, Poland, April 2003.
- *4th Annual Workshop on Binary Translation (WBT-2002),* Charlottesville, Virginia, September 2002.
- *Fifth ECOOP Workshop on Object-Orientation and Operating Systems (ECOOP-OOOSWS 2002),* Málaga, Spain, June 2002.
- *Fifth IEEE International Symposium on Object-Oriented Real-Time Distributed Computing (ISORC 2002),* Washington, D.C., April–May 2002.
- *11th International Conference on Compiler Construction (CC'2002),* Grenoble, France, March 2002.
- *Fourth IEEE International Symposium on Object-Oriented Real-Time Distributed Computing (ISORC 2001),* Magdeburg, Germany, May 2001.
- *Fifth Joint Modular Languages Conference (JMLC 2000),* Zurich, Switzerland, September 2000.
- *Third Workshop on Distributed Communities on the Web (DCW 2000),* Quebec City, Canada, June 2000.
- *Third IEEE International Symposium on Object-Oriented Real-Time Distributed Computing (ISORC 2000),* Newport Beach, California, March 2000.
- *European Symposium on Programming (ESOP 2000),* Berlin, Germany, March/April 2000.
- *Workshop on Binary Translation* (in conjunction with the International Conference on Parallel Architectures and Compilation Techniques, PACT '99), Newport Beach, California, October 1999.
- *ACM Sigplan 1999 Workshop on Compiler Support for System Software (WCSSS'99),* Atlanta, Georgia, May 1999.
- *Fourth California Software Symposium (CSS'98),* Irvine, California, October 1998.
- *Workshop on Principles of Abstract Machines* (in conjunction with the joint international symposia SAS'98 and PLILP/ALP'98), Pisa, Italy, September 1998.

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- *ACM Sigplan Conference on Programming Language Design and Implementation (PLDI'98),* Montreal, Canada, June 1998.
- *Fourth Joint Modular Languages Conference (JMLC'97),* Linz, Austria, March 1997.

Session Chair

- *2023 IEEE Symposium on Security and Privacy ("Oakland"),* San Francisco, California; May 2023.
- *2022 USENIX Security Conference,* Boston, Massachusetts; August 2022.
- *2021 USENIX Security Conference,* Vancouver, British Columbia; August 2021.
- *2021 IEEE Symposium on Security and Privacy ("Oakland"),* San Francisco, California; May 2021.
- *27th ACM Conference on Computer and Communications Security (ACM CCS 2020),* Orlando, Florida; November 2020.
- *2020 IEEE Symposium on Security and Privacy ("Oakland"),* San Francisco, California; May 2020.
- *26th ACM Conference on Computer and Communications Security (CCS 2019),* London, United Kingdom; November 2019.
- *2019 IEEE Symposium on Security and Privacy ("Oakland"),* San Francisco, California; May 2019.
- *25th ACM Conference on Computer and Communications Security (CCS 2018),* Toronto, Canada; October 2018.
- *38th IEEE International Conference on Distributed Computing Systems (ICDCS 2018),* Vienna, Austria; June 2018.
- *2018 ACM Asia Conference on Computer and Communications Security (ASIACCS 2018),* Incheon, South Korea; June 2018.
- *Third IEEE European Symposium on Security and Privacy 2018 (EuroS&P2018),* London, United Kingdom; April 2018.
- *Usenix Security 2017,* Vancouver, British Columbia; August 2017.
- *23rd ACM Conference on Computer and Communications Security (CCS 2016),* Vienna, Austria; October 2016.
- *First IEEE European Symposium on Security and Privacy 2016 (EuroS&P2016),* Saarbrücken, Germany; March 2016.
- *22nd ACM Conference on Computer and Communications Security (CCS 2015),* Denver, Colorado; October 2015.
- *10th Conference on High Performance and Embedded Architecture and Compilation (HiPEAC 2015),* Amsterdam, Netherlands; January 2015.
- *6th International Conference on Trust and Trustworthy Computing (TRUST 2013),* London, United Kingdom; June 2013.
- *22nd International Conference on Compiler Construction (CC 2013),* Rome, Italy; March 2013.
- *28th Annual Computer Security Applications Conference (ACSAC 2012),* Orlando, Florida; December 2012.
- *11th International Conference on Generative Programming and Component Engineering (GPCE 2012),* Dresden, Germany; September 2012.
- *27th Annual Computer Security Applications Conference (ACSAC 2011),* Orlando, Florida; December 2011.
- *ACM Sigplan Conference on Programming Language Design and Implementation (PLDI 2011),* San Diego, California; June 2011.
- *26th Annual Computer Security Applications Conference (ACSAC 2010),* Austin, Texas; December 2010.
- *19th ACM/IEEE/IFIP International Conference on Parallel Architectures and Compilation Techniques (PACT 2010),* Vienna, Austria; September 2010.
- *ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments (VEE 2010),* Pittsburgh, Pennsylvania; March 2010.

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- *23rd Annual Computer Security Applications Conference (ACSAC 2007),* Miami Beach, Florida; December 2007.
- *Seventh Joint Modular Languages Conference (JMLC 2006),* Oxford, United Kingdom, September 2006.
- *Invitational Workshop on the Future of Virtual Execution Environments,* Armonk, New York; September 2004
- *New Security Paradigms Workshop (NSPW 2004),* White Point, Nova Scotia, September 2004.
- *The Fourth IEEE International Conference on Peer-to-Peer Computing (P2P 2004),* Zurich, Switzerland, August 2004.
- *Southern California Parallel Processing and Computer Architecture Workshop,* Los Angeles, California, May 2004.
- *Sixth Joint Modular Languages Conference (JMLC 2003),* Klagenfurt, Austria, August 2003.
- *Ninth International Workshop on Compilers for Parallel Computers (CPC 2001),* Edinburgh, Scotland, June 2001.
- *Fourth IEEE International Symposium on Object-Oriented Real-Time Distributed Computing (ISORC 2001),* Magdeburg, Germany, May 2001.
- *Workshop on Binary Translation* (in conjunction with the International Conference on Parallel Architectures and Compilation Techniques, PACT '99), Newport Beach, California, October 1999.
- *ACM Sigplan Conference on Programming Language Design and Implementation (PLDI'98),* Montreal, Canada, June 1998.
- *Fourth Joint Modular Languages Conference (JMLC'97),* Linz, Austria, March 1997.

Other Service

- Member, *IEEE Computer Society Fellows Evaluation Committee*; 2023.
- Member, *IEEE Computer Society Fellows Evaluation Committee*; 2022.
- Member, *Fraunhofer CyberStar Award for Graduate Students in Israel Selection Committee*; 2020–2021.
- Member, *IEEE Computer Society Fellows Evaluation Committee*; 2020.
- Member, *IEEE Computer Society Publication Board Best Paper Award (BPA) Committee for IEEE Transactions on Dependable and Secure Computing (TDSC);* 2019.
- Member, *Fraunhofer CyberStar Award for Graduate Students in Israel Selection Committee*; 2019–2020.
- Member, *IEEE Computer Society Fellows Evaluation Committee*; 2019.
- Full Voting Member, *IFIP Working Group 2.4 ("Software Implementation Technology"),* 2002 – 2018 (elevated to Emeritus Member in July 2018).
- Member, *IFIP Working Group 11.3 ("Data and Application Security and Privacy"),* 2008 – 2017.
- Shadow PC Member, *2017 ACM Asia Conference on Computer and Communications Security (ASIACCS 2017),* Abu Dhabi, UAE; April 2017.
- Member, *IEEE Computer Society Fellows Evaluation Committee*; 2016.
- Nomination Committee Member, MacArthur Fellows Program, *John D. and Catherine T. MacArthur Foundation*; 2016.
- External Review Committee Member, *28th European Conference on Object-Oriented Programming (ECOOP'2014),* Uppsala, Sweden; July/August 2014.
- External Review Committee Member, *ACM Research Conference on Object-Oriented Programming (OOPSLA 2013),* Indianapolis, Indiana; October 2013.
- External Review Committee (ERC) Member, *ACM Sigplan Conference on Programming Language Design and Implementation (PLDI 2013),* Seattle, Washington; June 2013.
- Paper Shepherd, *2011 New Security Paradigms Workshop (NSPW 2011),* Sonoma, California; September 2011.
- Organization Committee Member and Sponsorship co-chair, *EuroSys 2011*, Salzburg, Austria; March 2011.

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- Organizing Committee Member (Student Travel Chair), *Fourteenth International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '09),* Washington, D.C.; March 2009.
- Panels Chair and Conference Committee Member, *24th Annual Computer Security Applications Conference (ACSAC 2008),* Anaheim, California; December 2008.
- Steering Committee Member, *ACM SIGPLAN/SIGOPS/USENIX International Conference Series on Virtual Execution Environments (VEE),* 2004 – 2008.
- Local Arrangements Chair, *IFIP WG2.4 Working Meeting,* Arrowhead, California, May 2007.
- Local Arrangements Co-Chair, *New Security Paradigms Workshop (NSPW 2006),* Dagstuhl, Germany, September 2006.
- **Founding Steering Committee Co-Chair** (with Sam Midkiff of Purdue University), *ACM SIGPLAN/SIGOPS/USENIX International Conference Series on Virtual Execution Environments (VEE),* September 2004 – June 2005.
- **General Chair**, *ACM SIGPLAN 2004 Workshop on Interpreters, Virtual Machines and Emulators (IVME 2004),* Washington, D.C., June 2004.
- Observer, *IFIP Working Group 2.4,* February 1998 – November 2002 (elected to full membership on November 14th).
- Tutorials Chair, *ACM Sigplan Conference on Programming Language Design and Implementation (PLDI 2000),* Vancouver, Canada, June 2000.
- Local Arrangements Co-Chair, *Third IEEE International Symposium on Object-Oriented Real-Time Distributed Computing (ISORC 2000),* Newport Beach, California, March 2000.
- Executive Committee Member, *The Institute for Software Research at UC Irvine,* July 1999–January 2002.
- Charter Member, *The Institute for Software Research at UC Irvine,* July 1999.
- Session Organizer and Host, *Bay Area Round Table (BART),* Palo Alto, California, February 1999.
- Executive Committee Member, *Irvine Research Unit in Software (IRUS)* [precursor to The Institute for Software Research], January 1996 – June 1999.
- Swiss Delegate to *IFIP Technical Committee No. 2,* "Software: Theory and Practice," 1995–1996 term.
- Program Committee Chair, *Oberon Track at the First Joint Annual Conference of the Gesellschaft für Informatik and the Schweizer Informatiker Gesellschaft,* Zürich, September 1995.
- Executive Committee Member, *Special Interest Group on Oberon of the Schweizer Informatiker Gesellschaft,* 1994–1996.
- Organizing Committee Member, *Conference on Programming Languages and System Architectures,* Zürich, March 1994.

Grant Application Review Panel Member

- *National Science Foundation, Program on Software and Trusted Computing (SaTC),* Arlington, Virginia, January 2016.
- *National Science Foundation, Program on Software and Trusted Computing (SaTC),* Arlington, Virginia, October 2012.
- *National Science Foundation, Program on Software and Trusted Computing (SaTC),* Arlington, Virginia, May 2012.
- *National Science Foundation, Program on Computer and Network Systems,* Arlington, Virginia, April 2009.
- *National Science Foundation, Program on Foundations of Computing Processes and Artifacts,* Arlington, Virginia, February 2007.
- *National Science Foundation, CAREER Program in CyberTrust,* Arlington, Virginia, November 2005.

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- *National Science Foundation, CAREER Program in Networking and Security,* Arlington, Virginia, November 2003.
- *National Science Foundation, Program in Embedded & Hybrid Systems,* Arlington, Virginia, June 2002.

Invited Keynotes, Presentations and Panels at Conferences

- M. Franz; "Fast and Furious: How the Web got Turbo Charged Just In Time…," ACM Breakthrough Lecture, *ASPLOS 2022,* Lausanne, Switzerland, March 2022.
- M. Franz; "Cyber Attacks And Defenses: Trends, Challenges, and Outlook," *CyberSecurity@KAIST Workshop,* Daejeon, South Korea, June 2018.
- M. Franz; "From Fine Grained Code Diversity to Execute-No-Read: The Cat and Mouse Game Between Attackers and Defenders Continues," *2nd ACM Workshop on Moving Target Defense (MTD 2015),* Denver, Colorado; October 2014.
- M. Franz; "Biologically Inspired Software Defenses," *Fifteenth High Confidence Software and Systems Conference (HCSS 2015),* Annapolis, Maryland; May 2015.
- M. Franz; "Code Diversity and Biologically Inspired Computer Defenses" (Invited Keynote), *TTI/Vanguard Reprogramming Programming),* Arlington, Virginia; September/October 2014.
- M. Franz; "Software Diversity as a Cyber Defense" (Invited Keynote), *The Next Generation Malware Attacks and Defense Workshop (NGMAD),* New Orleans, Louisiana; December 2013.
- M. Franz; "Eliminating the Insider Threat in Software Development by Combining Parallelism, Randomization and Checkpointing" (Invited Keynote Address); *Fourth Annual Cyber Security and Information Intelligence Research Workshop (CSIIRW'08),* Oak Ridge National Laboratory, Oak Ridge, Tennessee; May 2008.
- M. Franz; "Security and Privacy in Service Oriented Architectures" (Panelist); *21st Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSEC'07),* Redondo Beach, California; July 2007.
- M. Franz; "Erinnerungen und Ausblicke: Was haben wir gelernt? Und was soll die nächste Generation lernen?" (Invited Panelist); *Tag der Informatik,* ETH Zurich, Switzerland, October 2006.
- M. Franz; "A New Approach to Embedded Java" (Invited Keynote Address); *Mobile Information & Communication Systems, Scientific Conference,* Zurich, Switzerland, October 2006.
- M. Franz; "Pervasive Security" (Panelist); *Software Security Panel, National Science Foundation, Trusted Computing Program, PI Meeting,* Pittsburgh, Pennsylvania; August 2004.
- M. Franz; "Safe Code: It's Not Just For Applets Anymore" (Invited Keynote Address); *Sixth Joint Modular Languages Conference (JMLC 2003),* Klagenfurt, Austria, August 2003.
- M. Franz; "Pervasive Security" (Panelist); *Trusted Computing Panel, National Science Foundation, Trusted Computing Program, PI Meeting,* Baltimore, Maryland; August 2003.
- M. Franz; "The Source is The Proof" (Panelist); *NSPW Panel, 18th Annual Computer Security Applications Conference (ACSAC-18),* Las Vegas, Nevada; December 2002.
- M. Franz; "Extensible Programming: Ein neues Paradigma für die Softwareentwicklung" (Invited Keynote Address, in German); *Moderne Programmierparadigmen,* conference sponsored by Gesellschaft für Informatik, FH Braunschweig-Wolfenbüttel, Germany; October 1994.

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Meeting Participation By Invitation († = I gave a presentation, ‡ = my student gave a presentation, * = I presented a poster)

Note: Presentations at conferences with proceedings are documented under "Publications" above and are not listed again here.

- ‡ *"Außen- und sicherheitspolitische Aspekte chinesischer Komponenten in der deutschen Netzinfrastruktur,"* closed expert workshop at the German Foreign Ministry, Berlin, Germany, June 2023.
- ‡*Black Hat Briefings 2020,* Las Vegas, Nevada, August 2020.
- †*Third AmSEC Workshop on Systems Security,* Amsterdam, Netherlands, October 2019.
- ‡*Black Hat Briefings 2019,* Las Vegas, Nevada, August 2019.
- ‡*Qualcomm Product Security Summit,* San Diego, California, May 2019.
- *DARPA Cyber Fault-tolerant Attack Recovery (CFAR) PI Meeting,* Chantilly, Virginia, January 2018.
- †*IFIP WG2.4 Working Meeting,* Essex, Vermont, October 2017.
- *DARPA Cyber Fault-tolerant Attack Recovery (CFAR) PI Meeting,* Chantilly, Virginia, May/June 2017.
- †*IFIP WG2.4 Working Meeting,* Dresden, Germany, December 2016.
- *DARPA Cyber Fault-tolerant Attack Recovery (CFAR) PI Meeting,* Chantilly, Virginia, November 2016.
- *DARPA Cyber Fault-tolerant Attack Recovery (CFAR) PI Meeting,* Arlington, Virginia, April 2016.
- *DARPA Cyber Fault-tolerant Attack Recovery (CFAR) PI Meeting,* Arlington, Virginia, January 2016.
- †*M.I.T. Invitational Think-Shop on Multi-Spectrum Metrics for Cyber Defense,* sponsored by the National Science Foundation, Arlington, Virginia; December 2015.
- *DARPA Cyber Fault-tolerant Attack Recovery (CFAR) PI Meeting,* Arlington, Virginia, November 2015.
- †*DARPA Cyber Fault-tolerant Attack Recovery (CFAR) PI Meeting,* Arlington, Virginia, August 2015.
- †*DARPA Cyber Fault-tolerant Attack Recovery (CFAR) Kick-Off PI Meeting,* Arlington, Virginia, May 2015.
- †*DARPA Joint Clean-Slate Design of Resilient, Secure Hosts (CRASH) & Mission-Oriented Resilient Clouds (MRC) PI Meeting,* Jacksonville, Florida, September 2014.
- †*IFIP WG2.4 Working Meeting,* Asilomar, Pacific Grove, California, February 2014.
- †*DARPA Joint Clean-Slate Design of Resilient, Secure Hosts (CRASH) & Mission-Oriented Resilient Clouds (MRC) PI Meeting,* San Diego, California, January 2014.
- †*M.I.T. Invitational Think-Shop on Multi-Spectrum Metrics for Cyber Defense,* sponsored by the National Science Foundation, Cambridge, Massachusetts; October 2013.
- *Facebook Faculty Summit,* Menlo Park, California, August 2013.
- †*DARPA Joint Clean-Slate Design of Resilient, Secure Hosts (CRASH) & Mission-Oriented Resilient Clouds (MRC) PI Meeting,* Park Ridge, New Jersey, May 2013.
- **National Security Agency, First Annual Science of Security (SoS) Community Meeting,* National Harbor, Maryland, November 2012.
- †*DARPA Joint Clean-Slate Design of Resilient, Secure Hosts (CRASH) & Mission-Oriented Resilient Clouds (MRC) PI Meeting,* San Diego, California, November 2012.
- *DARPA Mission-oriented Resilient Clouds (MRC) Program, PI Meeting,* San Diego, California, October 2012.

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- †*DARPA Clean-Slate Design of Resilient, Secure Hosts (CRASH) Program, PI Meeting,* Boston, Massachusetts, May 2012.
- *DARPA Colloquium on Future Directions in Cyber Security,* Arlington, Virginia, November 2011.
- †*DARPA Clean-Slate Design of Resilient, Secure Hosts (CRASH) Program, PI Meeting,* Arlington, Virginia, November 2011.
- †*2nd Army Research Office (ARO) Workshop on Moving Target Defense,* Fairfax, Virginia, October 2011.
- †*DARPA Clean-Slate Design of Resilient, Secure Hosts (CRASH) Program, PI Meeting,* San Jose, California, May 2011.
- *Microsoft Research Faculty Summit,* Redmond, Washington, July 2010.
- †*IFIP WG2.4 Working Meeting,* Berg en Terblijt, Netherlands, January 2010.
- *Networking and Information Technology Research and Development (NITRD) Program, National Cyber Leap Year Summit,* Arlington, Virginia, August 2009.
- †*National Intelligence Community, Enterprise Cyber Assurance Program (NICECAP), PI Meeting,* Washington, D.C., September 2008.
- *Google Faculty Summit,* Mountain View, California, July 2008.
- †*National Intelligence Community, Enterprise Cyber Assurance Program (NICECAP), Reverse Site Visit,* Jessup, Maryland, January 2008.
- †NCDI Workshop on Game-changing Solutions for Cyber Security (jointly sponsored by NSF, DHS, IARPA, NSA, ONR, and OSD), College Park, Maryland, November 2007.
- †*National Intelligence Community, Enterprise Cyber Assurance Program (NICECAP), PI Meeting,* Boston, Massachusetts, September 2007.
- *U.S. Department of Energy Workshop on Cyber Security Research Needs for Open Science,* Bethesda, Maryland, July 2007.
- †*IFIP WG2.4 Working Meeting,* Arrowhead, California, May 2007.
- †*National Intelligence Community, Enterprise Cyber Assurance Program (NICECAP), Program Kick-Off Meeting,* Chantilly, Virginia, March 2007.
- †*U.S. Department of Homeland Security, S&T CyberSecurity R&D PI Meeting,* Menlo Park, California, February 2007.
- †*National Science Foundation Safe Computing Workshop,* Albuquerque, New Mexico, November/December 2006.
- †*U.S. Department of Homeland Security, S&T CyberSecurity R&D PI Meeting,* Arlington, Virginia, August 2006.
- †*IFIP WG2.4 Working Meeting,* Glasgow, Scotland, July 2006.
- *The First Workshop on Advances in Trusted Computing,* Tokyo, Japan, March 2006.
- †*U.S. Department of Homeland Security, S&T CyberSecurity R&D PI Meeting,* Menlo Park, California, January 2006.
- *National Science Foundation, Trusted Computing Program, PI Meeting,* Newport Beach, California, September 2005.
- †*U.S. Department of Homeland Security, BAA 04-17, Program Kick-Off Meeting,* Arlington, Virginia, July 2005.

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- *Microsoft Academic Days in Silicon Valley,* Mountain View, California, October 2004.
- *Microsoft Research 2004 Faculty Summit,* Redmond, Washington, August 2004.
- †*Southern California Parallel Processing and Computer Architecture Workshop,* Los Angeles, California, May 2004.
- †*ONR Critical Infrastructure Protection, Mobile Code Program, Final Review,* Annapolis, Maryland, May 2004.
- †*IFIP WG2.4 Working Meeting,* Brisbane, Australia, March 2004.
- †*IFIP WG2.4 Working Meeting,* Santa Cruz, California, August 2003.
- †*ONR Critical Infrastructure Protection, Mobile Code Program, PI Meeting,* Ithaca, New York, July 2003.
- †*ONR Critical Infrastructure Protection, Mobile Code Program, Review Meeting,* Arlington, Virginia, June 2003.
- *DARPA Organically Assured and Survivable Information Systems (OASIS) Program, PI Meeting,* Fort Lauderdale, Florida, January 2003.
- †*ONR Critical Infrastructure Protection, Mobile Code Program, PI Meeting,* Irvine, California, January 2003.
- †*IFIP WG2.4 Working Meeting,* Dagstuhl, Germany, November 2002.
- †*DARPA Organically Assured and Survivable Information Systems (OASIS) Program, PI Meeting,* Santa Rosa, California, August 2002.
- †*ONR Critical Infrastructure Protection, Mobile Code Program, PI Meeting,* State College, Pennsylvania, July 2002.
- †*IFIP WG2.4 Working Meeting,* Simon's Town, South Africa, March 2002.
- †*Southern California Parallel Processing and Computer Architecture Workshop,* Irvine, California, February 2002.
- †*ONR Critical Infrastructure Protection, Mobile Code Program, PI Meeting,* Melbourne, Florida; January 2002.
- †*DARPA Organically Assured and Survivable Information Systems (OASIS) Program, PI Meeting,* Santa Fe, New Mexico; July 2001.
- †*ONR Critical Infrastructure Protection, Mobile Code Program, PI Meeting,* Arlington, Virginia; July 2001.
- †*Symposium on Research in Mobile Computing Systems,* Zurich, Switzerland; May 2001.
- †*DARPA Organically Assured and Survivable Information Systems (OASIS) Program, PI Meeting,* Norfolk, Virginia; February 2001.
- *University of Washington and Microsoft Research Summer Institute 2000, "Accelerating the Pace of Software Tools Research: Sharing Infrastructure",* hosted by C. Chambers, D. Notkin, A. Srivastava, and B. Zorn; Seattle, Washington; August 2000.
- †*DARPA Intrusion Tolerant Systems (ITS) Program, PI Meeting,* Honolulu, Hawaii; July 2000.
- ‡*17th Gesellschaft für Informatik (GI) Workshop on Programming Languages and Computing Concepts (with Special Emphasis on Software Components),* Bad Honnef, Germany; May 2000.
- †*DARPA Intrusion Tolerant Systems (ITS) Program, PI Meeting,* Aspen, Colorado; February 2000.
- †*DARPA Intrusion Tolerant Systems (ITS) Program, PI Meeting,* Phoenix, Arizona; August 1999.
- *National Science Foundation CAREER Program, PI Meeting,* Washington, D.C.; January 1999.
- †*Southern California Parallel Processing and Computer Architecture Workshop,* Irvine, California; March 1998.
- †*International Workshop on Component-Oriented Programming,* Linz, Austria; July 1996.
- *Third International Workshop on Workstation Operating Systems,* Key Biscayne, Florida; April 1992.

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Administrative Service

- University of California, Member, *UCI Information Security & Privacy Committee,* 2023–24, 2024–2025, 2025–2026.
- University of California, Inaugural Member, *UCI Cybersecurity Oversight Committee,* 2022–23, 2023–24.
- Department of Computer Science, *Faculty Search Committee, Positions in Systems,* 2017–18, 2018–19, 2019–20, 2020–21, 2022–23.
- Donald Bren School of Information and Computer Science, Chair, *Computing and Network Policy Committee,* 2016–17, 2017–18, 2018–19, 2019–20, 2020–21. 2021-22.
- University of California, Vice Chair, *Irvine Campus Council on Planning and Budget,* 2015–2016, 2016–2017.
- University of California, Member, *Irvine Campus Council on Planning and Budget,* 2014–2015.
- Donald Bren School of Information and Computer Science, *Software Engineering Steering Committee,* 2013–2014, 2014–2015, 2015–2016, 2016–2017, 2017–2018.
- Department of Computer Science, *CS Graduate Admissions Committee,* 2016–2017.
- Department of Computer Science, *CS Admission and Graduate Student Planning Committee,* 2013–2014, 2014–2015, 2015–2016.
- University of California, Irvine, *5-year Organized Research Unit Review Committee for the Center for Embedded Computer Systems (CECS),* 2012.
- Donald Bren School of Information and Computer Science, *Executive Committee,* 2007–2008.
- Donald Bren School of Information and Computer Science, Chair, *Computing and Network Policy Committee,* 2005–2006, 2006–2007, 2008–2009.
- Donald Bren School of Information and Computer Science, *Marketing and Outreach Committee,* 2004–2005.
- University of California, *Irvine Campus Council on Undergraduate Admissions and Relations with Schools and Colleges,* 2000–2004.
- Donald Bren School of Information and Computer Science, Chair, *Faculty Search Committee, Position in Security and Cryptography,* 2002–2003.
- Donald Bren School of Information and Computer Science, *Committee on Graduate Policy,* 2002–2003.
- ICS Department, Chair, *Committee on Space Policy,* 2001–2002.
- ICS Department, *Faculty Search Committee, Position in Cryptography and Security,* 2000–2001.
- ICS Department, *Committee on Graduate Policy,* 2000–2001.
- ICS Department, *Ad-Hoc Faculty Search Committee, "Systems" Position,* 1999–2000.
- ICS Department, *Committee on Educational Policy,* 1999–2000.
- ICS Department, *Executive Committee,* 1998–1999.
- ICS Department, *Committee on Undergraduate Policy,* 1998–1999.
- ICS Department, *Faculty Search Committee, Multiple Positions in Interdisciplinary Applications of Computer Science,* 1998–1999. (Committee reviewed 170 applications = 4 linear feet of files and filled three open faculty positions.)
- University of California, *Irvine Campus Committee on Undergraduate Admissions and Relations with Schools and Colleges,* 1997–2000.

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- ICS Department, *Committee on Graduate Policy,* 1997–1998.
- ICS Department, *Committee on Graduate Admissions,* 1997–1998.
- ICS Department, *Faculty Search Committee, Position in "Informatics,"* 1997–1998.
- University of California, *Irvine Campus Representative Assembly,* 1996–1997.
- ICS Department, *Committee on Personnel,* 1996–1997.
- ICS Department, *Faculty Search Committee, Position in Software Engineering,* 1995–1996.

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Teaching Activities

Teaching Awards

- *Dean's Award for Graduate Student Mentoring*, Donald Bren School of Information and Computer Sciences, UC Irvine, 2022.
- *Dean's Award for Graduate Student Mentoring*, Donald Bren School of Information and Computer Sciences, UC Irvine, 2016, "For his outstanding mentoring of doctoral students over the last decade."
- *Dean's Award for Graduate Student Mentoring*, Donald Bren School of Information and Computer Sciences, UC Irvine, 2007.
- *Outstanding Professor of the Year Award*, Graduating Class of 2007, UC Irvine.

Post-Doctoral Habilitation Theses Supervised

- Dr. Christian Herrman, Universität Ulm, Germany; thesis: "Verbesserte prozedurale Programmiersprachen" (Improved Procedural Programming Languages); March 2007.

Post-Doctoral Fellows Supervised

1. Dr. Wolfram Amme
   (January–December 2000; first subsequent position: Privatdozent at the *University of Jena,* Germany).
2. Dr. Won-Kee Hong
   (October 2001–October 2002; first subsequent position: Assistant Professor at *Daegu University,* South Korea).
3. Dr. Fermin Reig
   (October 2001–July 2003; first subsequent position: Postdoc at *University of Nottingham,* United Kingdom).
4. Dr. Roxana Diaconescu
   (January 2003–September 2004; first subsequent position: PostDoc at *California Institute of Technology (Caltech),* Pasadena, California).
5. Dr. Christian Probst
   (January 2003–May 2005; first subsequent position: Assistant Professor at the *Technical University of Denmark (DTU)*, Lyngby, Denmark).
6. Dr. Andreas Gal
   (January 2007–February 2010, first subsequent position: Researcher at *Mozilla,* Mountain View, California).
7. Dr. Christian Stork
   (March 2007–September 2008).
8. Dr. Christian Wimmer
   (July 2008–April 2011, first subsequent position: Principal Member of Technical Staff, *Oracle Sun Labs,* Redwood Shores, California).
9. Dr. Stefan Brunthaler
   (April 2011–June 2015, first subsequent position: Key Researcher at *SBA Research,* Vienna, Austria).
10. Dr. Per Larsen
    (September 2011–June 2015, first subsequent position: Chief Executive Officer of *Immunant,* Irvine, California).
11. Dr. Stijn Volckaert
    (December 2015–July 2018, first subsequent position: Assistant Professor at *KU Leuven,* Belgium).

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12. Dr. Yeoul Na
(July 2016–March 2020, first subsequent position: Software Engineer at *Apple,* Cupertino, California).

13. Dr. David Gens
(March 2019–June 2022; first subsequent position: Software Engineer at *Cerebras Systems,* Sunnyvale, California).

14. Dr. Adrian Dabrowski
(May 2019–April 2022; first subsequent position: Researcher at *CISPA Helmholtz Center for Information Security,* Saabrücken, Gemany).

15. Dr. Dokyung Song
(January–March 2021, first subsequent position: Assistant Professor at *Yonsei University,* Seoul, South Korea).

16. Dr. Felicitas Hetzelt
(August 2022–November 2023. first subsequent position: Security Software Engineer at *Apple,* Paris, France).

Graduated Ph.D. Students (Principal Advisor and Dissertation Committee Chair)

1. Thomas Kistler
(affiliated in April 1995, candidacy: February 1998, final defense: November 1999; thesis: "Continuous Program Optimization;" first employment after graduation: *Transmeta, Inc.,* Santa Clara, California.

2. Peter H. Fröhlich
(affiliated in September 1998; advanced to candidacy in May 2001; final defense in March 2003; thesis: "The Structure of Component-Oriented Programming Languages;" first employment after graduation: *University of California, Riverside,* California).

3. Jeffery von Ronne
(affiliated in September 1999; advanced to candidacy in February 2003; final defense in July 2005; thesis: "A Safe and Efficient Machine-Independent Code Transportation Format Based on Static Single Assignment Form and Applied to Just-In-Time Compilation;" first employment after graduation: *University of Texas at San Antonio*).

4. Vivek Haldar
(affiliated in August 2000; advanced to candidacy: November 2002; final defense: February 2006; thesis: "Semantic Remote Attestation;" first employment after graduation: *Google,* Santa Monica, California).

5. Efe Yardimci
(affiliated in August 2001; advanced to candidacy: November 2003; final defense: March 2006; thesis: "Exploiting Parallelism to Improve the Performance of Sequential Binary Executables;" first employment after graduation: *Advanced Micro Devices (AMD),* Santa Clara, California).

6. Christian H. Stork
(affiliated in September 1998; advanced to candidacy: May 2001; final defense: August 2006; thesis: "WELL: A Language-Agnostic Foundation for Compact and Provably Safe Mobile Code;" first employment after graduation: Postdoc at *University of California, Irvine*).

7. Deepak Chandra
(affiliated in August 2001; advanced to candidacy: March 2004; final defense: September 2006; thesis: "Information Flow Analysis and Enforcement in Java Bytecode;" first employment after graduation: *Google,* Irvine, California).

8. Andreas Gal
(affiliated in January 2002; advanced to candidacy: December 2003; final defense: November 2006; thesis: "Efficient Bytecode Compilation and Verification in a Virtual Machine;" first employment after graduation: Postdoc at *University of California, Irvine*).

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9. Matthew Beers
(affiliated in September 1999; advanced to candidacy: July 2002; final defense: March 2007; thesis: "Shifting the Burden of Code Optimization to the Code Producer," first employment after graduation: *Ocean Tomo* Intellectual Capital Equity, San Francisco, California).

10. Ning Wang
(affiliated in September 2001; advanced to candidacy: September 2004; final defense: May 2007; thesis: "From Assumptions to Assertions: A Sound and Precise Points-to Analysis for the C Language," first employment after graduation: *Fortify Software*, Palo Alto, California).

11. Vasanth Venkatachalam
(affiliated in September 2002; advanced to candidacy: September 2003; final defense: May 2007; thesis: "Self-Calibrating Processor Speed: A New Feedback Loop For Dynamic Voltage Scaling Control;" first employment after graduation: *Advanced Micro Devices (AMD),* Austin, Texas).

12. Lei Wang
(affiliated in June 2001; advanced to candidacy: September 2004; final defense: June 2009; thesis: "Automatic Program Partitioning to Alleviate Resource Constraints of Object-Oriented Applications;" first employment after graduation: *Microsoft,* Redmond, Washington).

13. Babak Salamat
(affiliated in January 2007; advanced to candidacy: May 2007; final defense: June 2009; thesis: "Multi-Variant Execution: Run-Time Defense Against Malicious Code Injection Attacks;" first employment after graduation: *Yahoo,* Sunnyvale, California).

14. Michael Bebenita
(affiliated in January 2007; advanced to candidacy in May 2009; final defense: October 2011; thesis: "Trace-Based Compilation and Optimization in Meta-Circular Virtual Execution Environments;" first employment after graduation: *Mozilla,* Mountain View, California).

15. Gregor Wagner
(affiliated in September 2007; advanced to candidacy in May 2009; final defense: October 2011; thesis: "Domain Specific Memory Management in a Modern Web Browser;" first employment after graduation: *Mozilla,* Mountain View, California).

16. Mason Liu Chang
(affiliated in June 2007; advanced to candidacy in May 2009; final defense: February 2012; thesis: "Efficient Analysis and Optimization of Dynamically Typed Languages;" first employment after graduation: *Mozilla,* Mountain View, California).

17. Todd Morris Jackson
(affiliated in September 2007; advancement to candidacy in June 2009; final defense: May 2012; thesis: "On the Design, Implications, and Effects of Implementing Software Diversity for Security;" first employment after graduation: *Google,* Mountain View, California).

18. Christoph Kerschbaumer
(affiliated in Summer 2010; advancement to candidacy in November 2011; final defense: March 2014; thesis: "Probabilistic Information Flow Control in Modern Web Browsers;" first employment after graduation: *Mozilla,* Mountain View, California).

19. Eric Hennigan
(affiliated in July 2008; advancement to candidacy in April 2011; final defense: December 2014; thesis: "From FlowCore to JitFlow: Improving the Speed of Information Flow in JavaScript;" first employment after graduation: *Google,* Mountain View, California).

20. Marcelo Cintra
(affiliated in December 2007; advancement to candidacy in November 2009, final defense: April 2015; thesis:

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"Just-in-Time Compilation Techniques for Hardware/Software Co-Designed Processors;" first employment after graduation: *Intel,* Santa Clara, California).

21. Andrei Homescu
(affiliated in Fall 2010; advancement to candidacy in March 2012, final defense: April 2015; thesis: "Securing Statically and Dynamically Compiled Programs using Software Diversity;" first employment after graduation: *Immunant,* Irvine, California).

22. Codrut Stancu
(affiliated in Summer 2012; advancement to candidacy in May 2013, final defense: May 2015; thesis: "Safe and Efficient Hybrid Memory Management for Java;" first employment after graduation: *Oracle,* Redwood Shores, California).

23. Wei Zhang
(affiliated in Spring 2011; advancement to candidacy in November 2011, final defense: June 2015; thesis: "Efficient Hosted Interpreters for Dynamic Languages;" first employment after graduation: *Twitter,* San Francisco, California).

24. Stephen Crane
(affiliated in Fall 2011; advancement to candidacy in August 2013, final defense: June 2015; thesis: "Enhancing and Extending Software Diversity;" first employment after graduation: *Immunant,* Irvine, California).

25. Gulfem Savrun Yeniceri
(affiliated in Fall 2010; advancement to candidacy in January 2013, final defense: November 2015; thesis: "Efficient Interpreters and Profilers for Hosted Dynamic Languages;" first employment after graduation: *Intel,* Santa Clara, California).

26. Julian Lettner
(affiliated in Fall 2013; advancement to candidacy in March 2016, final defense: August 2018; thesis: "Finding and Mitigating Memory Corruption Errors in Systems Software;" first employment after graduation: *Apple,* Cupertino, California).

27. Brian Belleville
(affiliated in Fall 2013; advancement to candidacy in June 2016, final defense: August 2018; thesis: "Security Applications of Static Program Analysis;" first employment after graduation: *Google,* Mountain View, California).

28. Mohaned Qunaibit
(affiliated in Summer 2014; advancement to candidacy in March 2016, final defense: March 2019; thesis: "Accelerating Dynamically-Typed Language on Heterogeneous Platforms;" first employment after graduation: *Oracle,* Redwood Shores, California).

29. Joseph Nash
(affiliated in Summer 2015; advancement to candidacy in May 2018, final defense: May 2020; thesis: "Binary Recompilation via Dynamic Analysis and the Protection of Control and Data-Flows Therein;" first employment after graduation: *Advanced Micro Devices (AMD),* Boxborough, Massachusetts).

30. Alexios Voulimeneas
(affiliated in Summer 2015; advancement to candidacy in June 2018, final defense: May 2020; thesis: "Building the Next Generation of Security Focused NVX Systems: Overcoming Limitations of N-Variant Execution;" first employment after graduation: Post-Doctoral Researcher at *K U Leuven,* Belgium).

31. Prabhu Karthikeyan Rajasekaran
(affiliated in Spring 2015; advancement to candidacy in May 2018, final defense: May 2020; thesis: "Practical Run-Time Mitigations Against Data-Oriented Attacks;" first employment after graduation: *Google,* Mountain View, California).

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32. Anil Altinay
(affiliated in Summer 2015; advancement to candidacy in June 2018, final defense: May 2020; thesis: "Dynamic Binary Lifting and Recompilation;" first employment after graduation: *Google,* Mountain View, California).

33. Taemin Park
(affiliated in Summer 2015; advancement to candidacy in May 2018, final defense: May 2020; thesis: "Comprehensive Protection for Dynamically-Typed Languages: Avoiding the Pitfalls of Language-Level Sandboxing;" first employment after graduation: *Intel,* Santa Clara, California)).

34. Dokyung Song
(affiliated in Fall 2016; advancement to candidacy in May 2019, final defense: December 2020; thesis: "Precise and Efficient Dynamic Analysis of Systems Software;" after a brief period as a Post-Doctoral Researcher at UCI started as an Assistant Professor at *Yonsei University,* Seoul, South Korea)).

35. Paul Kirth
(affiliated in Fall 2016; advancement to candidacy in March 2019, final defense: November 2021; thesis: "Practical Methods for Automatic Intra-Process Compartmentalization with MPK;" first employment after graduation: *Google,* Mountain View, California).

36. Min-Yi Hsu
(affiliated in Fall 2018; advancement to candidacy in March 2021; final defense: July 2023; thesis: "Efficient Program Analyses that Scale to Large Codebases;" first employment after graduation: *SiFive*, San Mateo, California).

37. Fabian Parzefall
(affiliated in Summer 2018; advancement to candidacy in November 2021; final defense: May 2024; thesis: "Dynamic Program Analysis Enhanced Binary Recompilation;" first employment after graduation: *Meta*, Mountain View, California).

38. Chinmay Diwakar Deshpande
(affiliated in Fall 2019; advancement to candidacy in September 2022; final defense: May 2024; thesis: "Practical Recompilation of Multithreaded Binaries: Choreographing Static and Dynamic Techniques;" first employment after graduation: *AMD*, Santa Clara, California).

39. Mitchel Dickerson
(affiliated in Summer 2018; advancement to candidacy in May 2022; final defense: February 2025; thesis: "Practical Python FPGA Acceleration with Fast Just-In-Time Compilation and Configuration;" first employment after graduation: *MediaTek*, Woburn, Massachusetts).

40. André Rösti
(affiliated in Fall 2022; advancement to candidacy in May 2024; final defense: March 2025; thesis: "Survivable Multi-Variant Execution for Security and Availability;" first employment after graduation: *AMD*, Longmont, Colorado).

Graduate Students Supervised as Principal Academic Advisor and Committee Chair

Advanced to Ph.D. Candidacy (in order of advancement date)

1. Tianjiao Huang (from Summer 2023; advancement to candidacy in May 2024)

Not Yet Advanced to Candidacy (in order of affiliation date)

2. Hongyu Chen (from Spring 2023)
3. Nicholas Baron (from Fall 2023)
4. Po-An (Billy) Chen (from Fall 2023)

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5. Md Mahbub Hossain Raton (from Fall 2023)
6. Weitao Sun (from Fall 2023)
7. James William McGowan (from Summer 2024)

Graduated Ph.D. Students (Co-Advisor and "Opponent" During Final Dissertation Defense)

1. Christian Wimmer, University of Linz, Austria
   (final defense: March 2008; thesis: "Automatic Object Inlining in a Java Virtual Machine").
2. Stefan Brunthaler, Technical University of Vienna, Austria
   (final defense: February 2011; thesis: "Purely Interpretative Optimizations").
3. Thomas Würthinger, Johannes-Kepler University of Linz, Austria
   (final defense: April 2011; thesis: "Dynamic Code Evolution for Java").
4. Christian Häubl, Johannes-Kepler University of Linz, Austria
   (final defense: February 2015; thesis: "Generalized Trace Compilation for Java").
5. Stijn Volckaert, University of Ghent, Belgium
   (final defense: October 2015; thesis: "Advanced Techniques for Multi-Variant Execution").
6. Victor van der Veen, Vrije Universiteit Amsterdam, Netherlands
   (final defense: October 2019; thesis: "When Memory Serves Not So Well—Memory Errors 30 Years Later").
7. Robert E. Bühren, Technical University of Berlin, Germany
   (final Defense: February 2022; thesis: "Resource Control Attacks against Encrypted Virtual Machines).
8. Dominik Maier, Technical University of Berlin, Germany
   (final Defense: June 2022; thesis: "Automated Security Testing of Unexplored Targets through Feedback-Guided Fuzzing").
9. Felicitas Hetzelt, Technical University of Berlin, Germany
   (final Defense: June 2022; thesis: "Security Analysis of Hardware-OS Interfaces in Linux").
10. Julian Fietkau, Technical University of Berlin, Germany
    (final Defense: August 2023; thesis: "Full-Stack Security. How Fingerprinting Thwarts Security Gaps Across All Layers").
11. Vincent Ulitzsch, Technical University of Berlin, Germany
    (final Defense: July 2025; thesis: "Ensuring Reliable and Secure Deployment Of Emergent Workloads On Modern Microprocessors").

Other Ph.D. Students

Dissertation Committee Member

- Byron Hawkins, UC Irvine
  (final defense: August 2017; committee chair: Brian Demsky; thesis: "Introspective Intrusion Detection").
- Andreas Gerstlauer, UC Irvine
  (final defense: April 2004, committee chair: Daniel D. Gajski; thesis: "Modeling Flow for Automated System Design and Exploration").
- Ana Lucia Velloso Azevedo, UC Irvine
  (final defense: October 2002; committee chair: Alexandru Nicolau; thesis: "Annotation-based Compiler Technology").

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- Chang Liu, UC Irvine
  (final defense: August 2002, committee chair: Debra J. Richardson; thesis: "Redundant Arrays of Independent Components").
- Martin Burtscher, University of Colorado at Boulder
  (final defense: April 2000, committee chair: Benjamin Zorn; thesis: "Improving Context-Based Load Value Prediction").
- Jianwen Zhu, UC Irvine
  (final defense: September 1999; committee chair: Daniel D. Gajski; thesis: "Behavioral Synthesis from an Extensible Object Oriented Language").

Candidacy Committee Member

- Xiafa Wu, UC Irvine
  (candidacy: June 2024; committee chair: Brian Demsky).
- Conan Truong, UC Irvine
  (candidacy: June 2024; committee chair: Brian Demsky).
- Semen Pyankov, UC Irvine
  (candidacy: February 2022; committee chair: Alexander Veidenbaum).
- Claudio Parra, UC Irvine
  (candidacy: December 2020; committee chair: Isaac Scherson).
- Zhihao "Zephy" Yao, UC Irvine
  (candidacy: May 2020; committee chair: Ardalan Amiri Sani).
- Wail Alkowaileet, UC Irvine
  (candidacy: November 2019; committee chair: Michael J. Carey).
- Ivan Oliveira Nunes, UC Irvine
  (candidacy: December 2018; committee chair: Gene Tsudik).
- Tyler Kaczmarek, UC Irvine
  (candidacy: December 2015; committee chair: Gene Tsudik).
- Lu Fang, UC Irvine
  (candidacy: May 2014; committee chair: Guoquing Xu).
- Nicolae Savoiu, UC Irvine
  (candidacy: September 1999; committee chair: Alexandru Nicolau).

M.Sc. Students Graduated from UC Irvine with Thesis Option

- Wail Alkowaileet, M.S. thesis committee member, graduated October 2013 (thesis: "NUMA-aware multicore Matrix Multiplication;" committee chair: Isaac Scherson).
- Alexander Yermolovich, primary M.S. advisor / committee chair, completed M.S. degree in May 2009 (thesis: "Efficient Execution of Binary and Guest Virtual Machines on Platform Independent Host Virtual Machines").
- Mason Liu Chang, primary M.S. advisor / committee chair, completed M.S. degree in May 2009 (thesis: "Tracing for Web 3.0 – Trace Compilation for the Next Generation Web Applications").
- Songmei Han, primary M.S. advisor, graduated with a M.S. in Computer Science in June 2003 (she also received a Ph.D. in Cognitive Science, for which Barbara Dosher was the advisor); subsequently a tenure-track Assistant Professor of Cognitive Science and Computer Science at SUNY Oswego and now Usability Engineer at Apollo Group.

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- Anjum Gupta, M.S. thesis committee member, graduated June 2003 (thesis: Design and Implementation of an Adaptive Cache on a Configurable Processor; committee chair: Rajesh Gupta).

Other Graduate Advising

- Jason Alaya, primary M.S. advisor, Fall 2020 – Spring 2022, graduated June 2022.
- Dixin Zhou, primary M.S. advisor, Spring 2018 – Spring 2019, graduated June 2019.
- Faraz Zaerpoor, primary M.S. advisor, Fall 2016 – Spring 2018.
- Anton Vasick, primary M.S. advisor, Summer 2015 – Spring 2018.
- Mark Murphy, research advisor, Fall 2010 – Fall 2015.
- Divya Varshini Agavalam Padmanabhan, primary M.S. advisor, graduated June 2016.
- Nikhil Gupta, primary M.S. advisor, graduated June 2016.
- Roeland Singer-Heinze, primary M.S. advisor, graduated June 2016.
- Stephen Neisius, primary M.S. advisor, graduated Summer 2014.
- Karthikeyan Manivannan, primary advisor, 2007– 2011.
- Sergiy Zhenochin, primary M.S. advisor / committee chair, graduated Fall 2001.
- Prashant Saraswat, primary M.S. advisor / committee chair, graduated Fall 2001.
- Hans-Christian Stadler, primary M.S. advisor / committee chair, graduated June 1998.

Undergraduate Honors Students Graduated from UC Irvine

- Jeffrey Meng (honors research advisor); graduated with honors in 2025; honors thesis: “Data Spacing To Support Binary Lifting and Cross Recompilation Into CHERI”.
- James William McGowan (honors research advisor); graduated Summa Cum Laude in 2024; honors thesis: “Leveraging Superset Disassembly to Facilitate Partial Binary Rewriting and Hardening”.
- Anand Srinivasan (honors research advisor); graduated in 2024; honors thesis: “Hardware Acceleration of Tight Loops”.
- Eric Thomas Parsons (summer research advisor, Summer 2018).
- Muneeb Baig (honors research advisor); graduated Magna Cum Laude and Phi Beta Kappa in 2007; honors thesis: “Optimizing Array Bound Checking During Trace-Based Compilation”.
- Michael Masukawa (honors research advisor); graduated Summa Cum Laude and Phi Beta Kappa in 2007; honors thesis: “Dynamic Taint Propagation in Java Web Applications”.
- Jesse Morrow (honors research advisor); graduated Magna Cum Laude and Phi Beta Kappa in 2005.
- Matthew Chu (honors research advisor); graduated Phi Beta Kappa in 2004.
- Zachary Mouri (honors research advisor); graduated Phi Beta Kappa in 2004.
- Ronald Harvest (honors research advisor); graduated Summa Cum Laude and Phi Beta Kappa in 1999.
- Calvin Shen (honors research advisor); graduated Cum Laude in 1999.

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Other Undergraduate Advising

- Rasmus Tjalk-Boggild, visiting from DTU Lynby, Denmark, faculty research advisor; Summer 2016.
- Thomas Bourgenolle, visiting from ENSTA ParisTech, Paris, France, faculty research advisor; Summer 2015.
- Martin Imre, visiting from Technical University of Vienna, Austria, faculty research advisor; Summer 2015.
- Dominik Infuehr, visiting from Technical University of Vienna, Austria, faculty research advisor; Summer 2015.
- David Poetzsch-Heffter, visiting from University of Kaiserslautern, Germany, faculty research advisor; Summer 2015.
- Aditiya Verma, visiting from IIT (BHU) Varanasi, India, faculty research advisor; Summer 2015.
- William Lee, Troy Tech Senior Internship, supervisor; Summer 2015.
- Christos Ioannidis, visiting from University of Thessaly, Greece, faculty research advisor; Summer 2014.
- Mohit Mishra, visiting from Indian Institute of Technology, Varanasi, faculty research advisor; Summer 2014.
- Michalis Papamichail, visiting from Aristotle University of Thessaloniki, Greece, faculty research advisor; Summer 2014.
- Martin Schleiss, visiting from Technical University of Vienna, Austria, faculty research advisor; Summer 2014.
- Henry Elias Hernandez, faculty research advisor, Summer 2014.
- Daniel Nima Salehi, faculty research advisor, Summer 2014.
- Michael Stewart, faculty research advisor, Summer/Fall 2011.
- Jeffrey Bosboom, NSF Research Experiences for Undergraduates Summer Scholar, faculty advisor, 2011.
- Shawn Merrill, NSF Research Experiences for Undergraduates Summer Scholar, faculty advisor, 2011.
- Chris Austin, NSF Research Experiences for Undergraduates Summer Scholar, faculty advisor, 2010.
- Daniel A. Ehrenberg, Carleton University, NSF Research Experiences for Undergraduates Summer Scholar, faculty advisor, 2010.
- Sean Kocol, honors research advisor, 2009.
- Jonathan Mood, honors research advisor, 2009.
- Adrian Tran, honors research advisor, 2009.
- Yaoxiang Zhou, honors research advisor, 2008.
- Raymond Yu, honors research advisor, 2007/08.
- Stephen C. Reed, California Alliance for Minority Participation in Science (CAMP) Summer Scholar, faculty advisor, 2004.

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Visiting Diploma Students Supervised at UC Irvine

- Urs Fässler, ETH Zürich, Switzerland, co-supervised with Th. Gross; March–September 2012.
- Alen Stojanov, École polytechnique fédérale de Lausanne (EPFL), Switzerland, co-supervised with M. Odersky; September 2011–March 2012.
- Dominik Lichtenauer, Johannes-Kepler University of Linz, Austria, co-supervised with H. Mössenböck, September 2011–March 2012.
- Stefan Rath, Technische Universität Graz, Austria, co-supervised with Ch. Steger; July–December 2010.
- Franz Maier, Technische Universität Graz, Austria, co-supervised with Ch. Steger; March–September 2010.
- Christoph Kerschbaumer, Technische Universität Graz, Austria, co-supervised with Ch. Steger; March–September 2008.
- Giacomo Amorosa, ETH Zürich, Switzerland, co-supervised with J. Gutknecht; February–August 2008.
- Katharina Seke, Technische Universität Graz, Austria, co-supervised with Ch. Steger; July 2006–October 2006.
- Gregor Wagner, Technische Universität Graz, Austria, co-supervised with Ch. Steger; March 2006–October 2006.
- Albert Noll, Technische Universität Graz, Austria, co-supervised with Ch. Steger; March 2006–September 2006.
- Michael Rauch, Technische Universität Graz, Austria, co-supervised with Ch. Steger; March 2006–September 2006.
- Isabella Thomm, Universität Erlangen-Nürnberg, Germany, co-supervised with W. Schroeder-Preikschat; November 2005–February 2006.
- Michael Stilkerich, Universität Erlangen-Nürnberg, Germany, co-supervised with W. Schroeder-Preikschat; December 2004–February 2005 and November 2005–February 2006.
- Nicolas Marochow, Fachhochschule Braunschweig-Wolfenbüttel, Germany, co-supervised with R. Rüdiger; September 2004–January 2005.
- Jan Peterson, Universität Jena, Germany, co-supervised with W. Amme; May–September 2004.
- Tobias Körner, Fachhochschule Braunschweig-Wolfenbüttel, Germany, co-supervised with R. Rüdiger; March–August 2003.
- Alexander Apel, Universität Jena, Germany, co-supervised with W. Amme; September–November 2003.
- Christian Rattei, Fachhochschule München, Germany, co-supervised with K. Köhler; April–November 2000.
- Joachim Büchse, ETH Zürich, Switzerland, co-supervised with J. Gutknecht,' 1998.
- M. Burtscher, ETH Zürich, 1996.
  (work conducted at Irvine but thesis submitted in Zurich while Franz still had a formal association with ETH)
- M. Dätwyler, ETH Zürich, 1996.
  (work conducted at Irvine but thesis submitted in Zurich while Franz still had a formal association with ETH)

Diploma Students Supervised at ETH Zurich († = co-supervised with N. Wirth)

- E. Brandenberger, Oberon Module Interchange auf Intel-Prozessoren, 1996.
- D. Posva, Dynamische Reoptimierung auf einem RISC, 1996.
- M. Sperisen, Executable Content in WWW-Dokumenten: Java, 1996.
- †H. Buchser, Portable Objektfiles und codegenerierender Lader, 1995.
- †H. Domjan, Metaprogrammierung, 1995.

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- †O. Dreer, “Slim Binaries” auf Macintosh, 1995.
- †Th. Kistler, Smartest Recompilation, 1995.
- †Ch. Denzler, A Message Mechanism for Oberon, 1993.
- †E. Oertli, Oberon-2 für Macintosh, 1993.
- †I. Posva, Elimination redundanter Tests durch Programmanalyse, 1993.
- †Th. Bühlmann, Call Optimization for the MacOberon Compiler, 1992.
- †S. Ludwig, A Portable Object and Symbol File Format for Oberon, 1991.
- †S. Meier, Zeichenerkennung mittels Strukturanalyse, 1990.

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