IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

CARDWARE INC.,
Patent Owner

U.S. Patent No. 11,328,286
Issued: May 10, 2022

Declaration of William C. Easttom II Ph.D., D.Sc.

I. INTRODUCTION

1. I, William C. Easttom II Ph.D., D.Sc. (Chuck Easttom), have been retained by Cardware INC., ("Cardware"), to provide independent expert analysis and my opinion on certain issues relating to U.S. Patent 11,328,286 (hereafter referred to as the '286 patent). The scope of my assignment is set out below.

2. My analysis of that evidence, my background, and qualifications, as well as my conclusions on this matter are provided in this declaration.

II. BACKGROUND AND QUALIFICATIONS

3. I have 30 years of experience in the computer science industry including extensive experience with computer programming, databases, and computer networking. That experience includes extensive programming experience including software engineering for medical software, Department of Defense software, financial software, and other applications. I have authored 41 computer science books, including textbooks used at over 60 universities around the world.

4. I hold a Doctor of Science degree in Cyber Security from Capitol Technology University. I also hold a Doctor of Philosophy (Ph.D.) in Technology (focused on nanotechnology) from Capitol Technology University. I also have a Doctor of Philosophy (Ph.D.) in Computer Science from the University of Portsmouth. I also hold three master's degrees (one in Applied Computer

Science, one in Education, and one in Systems Engineering). I am an inventor with 25 computer science patents.

5. I am a Senior member and Distinguished Speaker for the Association of Computing Machinery (ACM) and a Senior Member and Distinguished Visitor of the Institute for Electrical and Electronics Engineering (IEEE). The IEEE is the world's largest and most preeminent engineering organization. Among other activities, the IEEE creates industry standards for a wide range of engineering disciplines, including software development standards. I am also a Distinguished Visitor of the IEEE. I have been a member of the IEEE Software & Systems Engineering Standards Committee for several years. I worked on the DevOps 2675 standards group from 2017 to 2019. I am also currently the Vice Chair of the IEEE p23026 Standards Group "Systems and Software Engineering -- Engineering and Management of Websites for Systems, Software, and Services Information." Furthermore, I am the Chair of IEEE P3123 Standard for Artificial Intelligence and Machine Learning (AI/ML) Terminology and Data Formats. I am also a member of the IEEE Engineering in Medicine and Biology Standards Committee. Standard for a Unified Terminology for Brain-Computer Interfaces P2731 from 2020 to present.

6. In addition to the summary, I have provided here, I describe my qualifications, issued patents, publications, and experience as an expert witness in greater detail in my CV, attached as Exhibit A.

III. MATERIALS CONSIDERED

7. In forming my opinions, I have reviewed the following:

a. For Case No. PGR2023-00012

i. The Petition for post grant review of U.S. Patent No. 11,328,286

ii. Exhibit 1001, U.S. Patent No. 11,328,286;

iii. Exhibit 1003, the January 11, 2023, declaration of Dr. Shamos;

iv. Exhibit 1012, U.S. Prov. Patent App. No. 61/794,891;

b. For Case No. PGR2023-00013

i. The Petition for post grant review of U.S. Patent No. 11,328,286

ii. Exhibit 1001, U.S. Patent No. 11,328,286;

iii. Exhibit 1003, the January 11, 2023, declaration of Dr. Shamos;

iv. Exhibit 1012, U.S. Prov. Patent App. No. 61/794,891; and

c. All references cited in this declaration.

IV. LEGAL PRINCIPLES AND ASSIGMENT

8. I have been asked to analyze and consider Dr. Shamos' opinion that the provisional application to which the '286 patent claims priority (61/794,891) does not disclose or otherwise reasonably convey to a person of ordinary skill

in the art ("POSITA") that the inventor was in possession of the subject matter claimed in the '286 patent.

9. For the purposes of this analysis, I considered the disclosure of the provisional itself, as well as the knowledge of a POSITA, as explained below.

10. I reserve the right to consider and analyze other portions of Dr. Shamos' opinion if and when requested.

V. PERSON OF ORDINARY SKILL IN THE ART

11. I understand that Dr. Shamos has posited that a POSITA would be "someone with (1) a bachelor's degree in computer science, computer engineering, electrical engineering, or a related field, and; (2) in addition, one to two years of experience working with payment processing and/or digital authentication systems, including familiarity with short-range wireless technologies such as RFID technology. Graduate education could substitute for professional experience, or significant experience in the field could substitute for education."

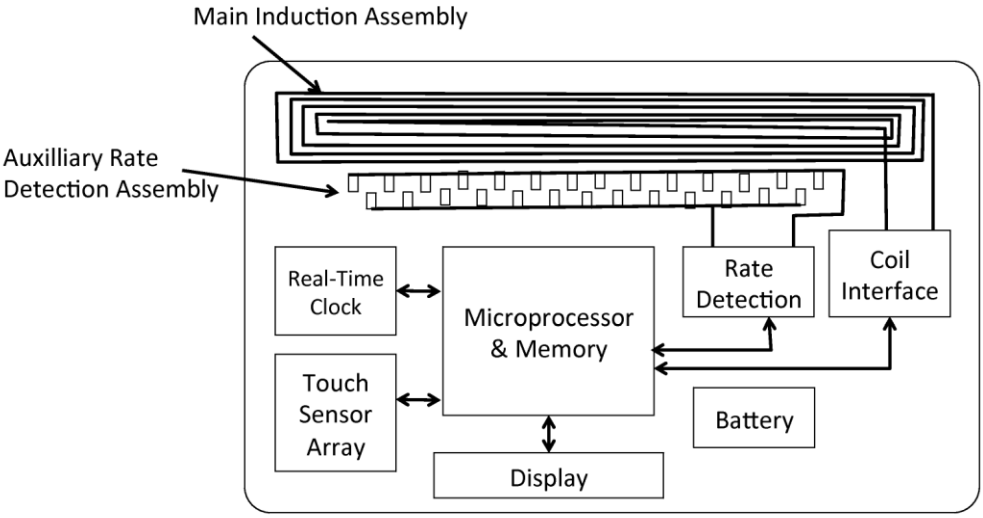
12. For the purposes of this declaration, I will use Dr. Shamos' definition of a POSITA.

VI. '286 PATENT CLAIM LIMITATIONS AT ISSUE

A. Claim 3: "Touch Screen . . ."

13. Dr. Shamos asserts that there is "no support in the '891 Provisional for the recitation of claim 3 that 'the touch-screen user interface is operable to control an access of the card device for payment transactions at an NFC Card Reader facility, and is operable to enable and disable NFC payment transactions by the card device."

14. A POSITA would recognize that the provisional application discusses touch screen user interfaces from the figure included in the provisional application, which shows a "Touch Sensor Array" and a "Display," each connected to a "Microprocessor & Memory." Ex. 1012, 19 (Figure).



15. It is also informative to consider common uses of the terms touch sensor and touch screen:

16. The Electronics Hub states that: "A touch sensor detects touch or near proximity without relying on physical contact. Touch sensors are making their

way into many applications like mobile phones, remote controls, control panels, etc. Present day touch sensors can replace mechanical buttons and switches."[1]

17. TeachEngineering.Org states "Touch sensors—called tactile sensors by engineers—are part of many devices that we use every day. Tactile sensors are sensitive to touch, force or pressure, and are made using light (optical), electricity or magnetism."[2]

18. According to lecture notes in the Electrical Engineering Department of UC Berkley, a touch screen functions by "an arrayed sensor detects some electrical interaction' when a 'finger touches the touch screen."[3]

19. The 2007 paper "An Overview of Optical-Touch Technologies"[4] describes touch screen and touch sensor being used interchangeably, specifically stating "These new LCDs integrate a light-sensing element (photodiode or phototransistor) into each LCD pixel, which allows the display to act as a

---

[1] https://www.electronicshub.org/touch-sensors/
[2] https://www.teachengineering.org/lessons/view/umo_sensorswork_lesson03
[3] https://inst.eecs.berkeley.edu//~ee16a/sp15/Lecture/Lecture_9.pdf
[4] Maxwell, I. (2007). An overview of optical-touch technologies. *Information Display*, *23*(12), 26.
https://walkermobile.com/December_2007_ID_Overview_of_Optical_Touch_Technologies.pdf

large- array photosensor; with appropriate image-analysis techniques, it can act as a touch sensor or even a card scanner."

20. Samsung's own website shows how tightly coupled touch screen and touch sensor are: "If the **screen** is wet, the **touch sensor** may not work properly. Even for waterproof models, some touch functions may not work if the product is used in water."[5] (emphasis added)

21. A POSITA would understand that when the provisional patent application discusses touch sensors, that a touch screen is a specific implementation of a touch sensor, and thus touch screens are disclosed in the provisional patent application.

22. Provisional claim 4 of the provisional application further discusses that the "device may incorporate a plurality of touch sensors which may allow user input of information . . . to confirm/deny transaction information . . . or with a gesture across said sensor for the purpose of lock/unlock or control access for transactions." Ex. 1012, 16. A POSITA would understand from this discussion that the provisional application supports the limitation, "touch-screen user interface operable to control an access of the card for payment transactions."

[5] https://www.samsung.com/us/support/troubleshooting/TSG01213974/

B. Claim 3: "payment transactions at a NFC Card Reader Facility"

23. Dr. Shamos asserts that the disclosure of "near field radio frequency" in the provisional patent is not sufficient to support the near field communications (NFC) limitation of claim 3.

24. A POSITA would first look at what the provisional patent application states:

25. In paragraph 4, the provisional patent application states "One type of credit card in circulation employs radio frequency ('RF') identification where there is a near field radio frequency. These cards essentially have a low power RF antenna built into the card and when the cardholder passes the antenna in front of a reader comprising an RF field, there is enough power generated and reduced for the processor to interact wirelessly with the receiving device." Ex. 1012, 9.

26. In paragraph 17 the provisional patent application states "In this embodiment, the card could use RFID or near field technology so that it can connect to a personal computer and be used to uniquely generate a credit card number for online purchases." Ex. 1012, 13-14.

27. This alone would be enough for a POSITA to conclude that the provisional patent application does indeed disclose, and the inventor was in possession of,

NFC payment transactions. However, there is also much more evidence of this, when considered from the perspective of a POSITA.

28. The Oxford Dictionary of Electronics and Electrical Engineering devices near field communication as "Wireless technology that enables two devices to communicate when within 4 cm of each other. The devices require *loop antennae and use electromagnetic induction to connect. They operate at a frequency of 13.56 MHz and can transfer data at rates from 106k to 424k bits/second. The main applications are in contactless payments systems and access control."[6]

29. That is a low powered antenna using a radio signal, precisely as described in the provisional patent application.

30. Stanford University describes NFC as follows: "Near Field Communication, more commonly known as NFC, is a subset of RFID that limits the range of communication to within 10 centimeters or 4 inches."[7]

---

[6] Butterfield, Andrew; Szymanski, John. A Dictionary of Electronics and Electrical Engineering (Oxford Quick Reference) (Kindle Locations 22202-22205). OUP Oxford.

[7] https://cs.stanford.edu/people/eroberts/cs181/projects/2010-11/NFCChips/difference.html

31. Carnegie Mellon University states "NFC is an offshoot of RFID with the exception that NFC is designed for use by devices within close proximity to each other."[8]

32. Therefore, a POSITA would understand that NFC is a type of RFID. A POSITA would then readily understand that the disclosure of "near field radio frequency" and of RFID credit card interactions with a "reader" in the provisional patent application, do indeed disclose Near Field Communications (NFC) payment transactions.

33. Dr. Shamos also asserts that, notwithstanding the above disclosures, "there is no disclosure in the '891 Provisional of using touch-screen input to control enabling or disabling of any payment transaction functionality." I disagree.

34. As noted above, the Figure in the provisional discloses a touch screen array. As described in the provisional (and above), the payment card could employ near field technology to communicate with other devices and/or a payment reader. Ex. 1012, 9 & 13-14 (paragraphs 4 and 17). The provisional further discloses that the touch screen can be used to "confirm/deny transaction information." Ex. 1012, 16 (provisional claim 4). This conveys to a POSITA that the touch screen can be used to control a transaction, including enabling or disabling. Further, given the other disclosures about near field technology,

[8] https://www.andrew.cmu.edu/course/14-760-s20/applications/ln/14760-l19.pdf

a POSITA would have understood that NFC could be used as a communication medium for achieving this functionality.

C. Claim 5

35. Dr. Shamos states that there is no disclosure in the provisional for ’286 patent claim 5, reciting: “The system of claim 1, wherein the payment card device is absent a payment number information necessary for completing an online transaction, and wherein the information presented on an interface of said card device, are limited to an in-store merchant card reader facility use only.” I disagree.

36. It is clear that the provisional disclosure is focused on a substitute payment card that protects against theft, including theft by onlookers who can see payment information on a traditional payment card (e.g., by a merchant). The provisional discloses a payment card that lacks traditional payment information printed on it. For example, “in one embodiment, the number on the front of the card can be a full or partial number . . . Effectively, a credit card can be created that has no fixed number and therefore cannot be stolen. Only the number generated at the instant the card is being used matters. Accordingly, unauthorized use of the card is nearly impossible because no transaction can be conducted with only the partial static part of the credit card number.”). Ex. 1012, 12-13 (paragraph 14). A POSITA would have

understood that in order to perform online transactions, a user would need to have complete issued account information as well as potentially other issuer-provided information. Given that the payment card disclosed in the provisional does not have visible account information, there is no way for a user to simply use the information that might be presented on an interface of the card (such as a partial number) to perform an online transaction.

37. Despite the lack of printed/visible payment information on the card, the provisional discloses that the card lacking payment information can still be used at an in-store merchant facility because it is capable of generating payment information at the time of the transaction. Ex. 1012, 12 (paragraph 14) ("As the credit card is being read by the machine, part or all of the number may be dynamically produced at the time the card is read."); *id*. at 18 (Abstract) ("A system is described to allow said device to emulate behavior of a credit card when used in electronic credit card readers . . . Methods are also described . . . to generate a one-time credit card number when read by said card readers . . .").

38. I disagree with Dr. Shamos's interpretation of paragraph 17 of the provisional, which he relies on for the proposition that the information presented on an interface of the card is suitable for both online and in-store transactions. This paragraph discusses online transactions, but it involves a personal computer.

It states that the card "could use RFID or near field technology so that it can ***connect to a personal computer*** and be used to ***uniquely generate a credit card number*** for online purchases." Ex. 1012, 13-14 (emphasis added). Accordingly, the information used for online transactions (via the personal computer) is unique from those used for other transactions (in-store).

39. For example, paragraph 14 explains that "As the credit card is read by the machine, part or all of the number may be dynamically produced at the time the card is read." Ex. 1012, 12-13. This may be based on "the user's private information, the user's bank information, the time of day or the facility that is reading the card." *Id.* An online transaction cannot use "the facility that is reading the card." *Id.* With this disclosure, a POSITA would understand that in certain embodiments, information presented on an interface is limited to an in-store merchant card reader facility reading the card.

D. Claim 6

40. Dr. Shamos states that "there is no disclosure of using 'a transaction information, a merchant, a facility information, a sequence counter, a payment card account information, secrets, and an information limited to said card device and to said card device' and to said computing device to generate a limited-use payment information at a card issuer authority as recited by challenged claim 6." I do not agree.

41. For example, as I noted above, paragraph 14 explains that a dynamic part of a number (i.e., limited-use payment information) can be based on "the facility that is reading the card." Ex. 1012, 12. A POSITA would understand that this could be a facility involved in the transaction generally and/or a merchant conducting the transaction. Definitions of the word facility are informative in this case:

42. Merriam Webster defines facility as "something (such as a hospital) that is built, installed, or established to serve a particular purpose"[9]

43. The Oxford Learners Dictionary defines facilities as "buildings, services, equipment, etc. that are provided for a particular purpose."[10]

44. Certainly, a merchant's place of business qualifies as a facility.

45. Claim 5 of the provisional application further provides that "transaction identifiers" (*e.g.*, "a merchant" or "facility information") can be used "to generate a limited-use number." Ex. 1012, 16. Dr. Shamos does not discuss this disclosure.

46. It is also my opinion that the provisional discloses the limitation of '286 patent, claim 6: "information limited to said card device and said computing device." For example, provisional claim 5 provides that a "counter unit"

---

[9] https://www.merriam-webster.com/dictionary/facility
[10] https://www.oxfordlearnersdictionaries.com/definition/english/facility

"generates a sequential parameter when the card is read by said credit card reader" and is combined with other information to generate a limited-use credit card number. Ex. 1012, 16 (provisional claim 5). While provisional claim 5 is directed to card-present (in facility) transactions, paragraph 17 of the provisional specification provides an embodiment where the card can also communicate a limited-use number to a separate electronic device, such as a personal computer. Specifically, the "card could use RFID or near field technology so that it can connect to a personal computer and be used to uniquely generate a credit card number for online purchases." Ex. 1012, 13-14 (paragraph 17). Accordingly, in the embodiment where the card is used in conjunction with the personal computer, the "counter unit" is "information limited to said card device and said computing device." I note that this is true even though the system "uniquely" generates numbers for online purchases.

E. Claim 12

47. Dr. Shamos (again with no explanation) states that there is no support in the provisional for claim 12. I think this is wrong.

48. Paragraph 16 of the '891 provisional application describes asking a security question. Ex. 1012, 13. Claim 12 of the '286 patent describes a security challenge. A security question is, as described in the provisional application, is used to "verify the customer's identity." Ex. 1012, 13 (paragraph 16).

Nothing in the provisional application limits the form of answering that question. Entering a pin number, supplying a biometric signal, entering a pattern, are all possible methods for answering a security question.

49. First, the provisional discloses "a card user personal information question." *See* Ex. 1012, 12 (paragraph 13, 13 (paragraph 16).

50. Second, the provisional discloses "a card issuer authority security question." *See* Ex. 1012, 12 (paragraph 13, 13 (paragraph 16).

51. Third, the provisional discloses "a user touch-screen entry." Ex. 1012, 12 (paragraph 13), 16, (provisional claim 4), 19 (Figure) (disclosing a touch sensor array and display coupled to a microprocessor and memory).

52. Fourth, the same provisions of the provisional disclose a "user touch-screen swipe" and "a user gesture of a device" as required by claim 12. This is explicit in provisional claim 4 of the provisional. Ex. 1012, 16.

53. Finally, the provisional discloses the limitations, ""a biometric sensing of a user touch"; "a biometric sensing of a recognized user proximity"; and "a biometric sensing of a recognized user." Ex. 1012, 12 (paragraph 13) ("[T]he card can comprise additional human inputs, e.g., touch sensors which can be formed by contacts that a user can press . . . There can also be additional inputs to key in customer specific information. For example, there can be inputs to key in a password or any other kind of unique identifier"); *id.*, 16 (provisional

claim 4) ("user input of information"). Claim 12 of the '286 patent requires that the computer is "operable to present at least one challenge, of a set of security challenges, comprising" the above biometric sensing limitations. In other words, the limitation is about presenting the security challenge. One of ordinary skill in the art would have understood disclosure of plurality of touch sensors, as well as the remaining disclosure in paragraph 13 and provisional claim 4, conveys these limitations.

54. For example, the online article Biometric Sensor Chips Information states "Biometric sensors consist of an array of tiny electrodes and an analog-to-digital converter (ADC) that digitizes information from the sensor array."[11]

55. The 2001 article "Innovations in fingerprint capture devices"[12] repeatedly discusses sensor arrays for biometrics.

56. The book Introduction to Biometrics states "A suitable user interface incorporating the biometric sensor or reader is needed to measure or record the raw biometric data of the user. For example, an optical fingerprint sensor may be used to image the friction ridge pattern at the tip of the finger."[13] A

---

11 https://www.globalspec.com/learnmore/semiconductors/sensor_ic/biometric_sensors

12 http://www.cse.msu.edu/~rossarun/BiometricsTextBook/Papers/Fingerprint/XiaFpCaptureDevices_PR03.pdf

13

POSITA would recognize that this particular description matches what is disclosed in the provisional patent application.

57. A POSITA would readily understand that touch sensor arrays are how fingerprint biometrics are accomplished[14,15,16]. Therefore, a POSITA would also understand that the "plurality of touch sensors" disclosed in the provisional patent application does support the limitations "a biometric sensing of a user touch," "a biometric sensing of a recognized user proximity," and "a biometric sensing of a recognized user" from claim 12 of the '286 patent.

58. It is unclear what else Dr. Shamos thinks is missing from the provisional to support claim 12. However, I note that Paragraph 13 of the provisional further discloses that the security responses can be used to reject or accept a user authorization.

F. Claim 15

Jain, Anil K.; Ross, Arun A.; Nandakumar, Karthik. Introduction to Biometrics (p. 4). Springer US. Kindle Edition

[14] Wettels, N., Santos, V. J., Johansson, R. S., & Loeb, G. E. (2008). Biomimetic tactile sensor array. Advanced robotics, 22(8), 829-849.

[15] Liu, J. C., Hsiung, Y. S., & Lu, M. S. C. (2011). A CMOS micromachined capacitive sensor array for fingerprint detection. IEEE Sensors Journal, 12(5), 1004-1010.

[16] Fritsche, G. O., & Miyatake, M. N. (1999, July). A simple fingerprint sensor based on ridge conductivity. In Proceedings of the Third International Workshop on Design of Mixed-Mode Integrated Circuits and Applications (Cat. No. 99EX303) (pp. 207-209). IEEE.

59. Dr. Shamos asserts that the provisional "briefly mentions that a credit card processing facility can 'authenticate' the transaction but does not describe the 'credit card processing facility' as being a card issuing authority or as performing the precise functions recited by limitations 15.11 and 15.12." Dr. Shamos does not address this from the perspective of a POSITA. There is no doubt that a POSITA would have understood that a credit card processing facility includes a card issuing authority. Indeed, the provisional discusses emulating a traditional credit card and using the existing payment infrastructure. Ex. 1012, 8-9 (paragraphs 2, 5), 18 (Abstract).

60. As one example, the 2006 paper Service Interaction through Role based Identity[17], states "Lufthansa.de checks this receipt of payment with credit card authority, for example, VISA for validation."

61. As another example, the U.S. Department of Justice refers to those who issue cards as "card issuing authorities."[18]

62. This would also be clear to a POSITA from the context of how the term credit card authority is used in the provisional patent application. For example, in claim 7 "transaction information to be displayed for user, merchant, bank or

[17] Chowdhury, M. M., & Noll, J. (2006). Service interaction through role based identity. In Proceedings of Wireless World Research Forum Meeting (Vol. 17).
[18] https://www.justice.gov/d9/opcl/docs/pia-pivcard-hspd12.pdf

credit card authority." The three parties to a transaction are the user, merchant, and whomever issued the credit card.

63. A POSITA would readily have understood that the provisional patent application does indeed clearly disclose this claim limitation of the '286 patent.

G. Claim 20

64. Dr. Shamos asserts that the provisional application does not support the limitation of claim 20, "wherein the computing device is operable to receive, store, display and transmit issuer-provided payment information, associated with, but not depicted on, the payment device." Dr. Shamos appears to focus exclusively on the "display" aspect of this limitation.

65. I next note that paragraph 16 of the '891 provisional patent application actually describes a display screen. Ex. 1012, 13. Paragraph 17 of the '891 provisional patent application describes the credit card number being displayed on an LCD screen. *Id.*, 13-14. Provisional claim 7 of the '891 provisional patent application also discloses displaying information. *Id.*, 16.

CONCLUSIONS

66. Based on the analysis presented in this declaration, it is my opinion that the identified limitations of the '286 patent discussed by Dr. Shamos are supported by the provisional patent application.

67. I hereby declare that all statements made in this Declaration of my own knowledge are true, that all statements made on information and believe are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 35 U.S.C. 1001.

Executed on May 15, 2023.

_____

William C. Easttom II Ph.D., D.Sc.

Exhibit A

Curriculum Vitae William C. Easttom II (Chuck Easttom)
chuckeasttom@gmail.com

Education

University Degrees

- **B.A.** Southeastern Oklahoma State University. Major Communications with Minors in Chemistry and Psychology. Extensive coursework in science (chemistry, physics, and biology) as well as specific courses in neuroscience (neurobiology of memory, cognitive science, etc.). Also, additional coursework in computer science including programming and database courses. While attending I was named to the National Dean's List.
- **M.Ed.** Southeastern Oklahoma State University. Coursework included technology related courses such as digital video editing, multimedia presentations, and computer graphics. A statistics course was also part of the coursework. While attending I was named to Who's Who in Colleges and Universities.
- **M.B.A**. Northcentral University major in Applied Computer Science. Extensive course work in graduate computer science including graduate courses in C++ programming, C# programming, Computer Graphics, Web Programming, Network communication, Complex Database Management Systems, and Artificial Intelligence. Approximately 30 graduate hours of graduate computer science courses. Additionally, a doctoral level statistics course was included. A semester research project in electronic medical software was also part of the curriculum. I also took several research courses beyond the requirements for the degree.
- **MSSE Master of Science in Systems Engineering**. University of Texas at El Paso. The coursework includes studies in software & system requirements; system integration, verification, and validation; system architecture and design; and systems modeling & simulation. 4.0 GPA member of Phi Kappa Phi honor society. Also, I am a member of the Gold Key Honor society.
- **D.Sc. Doctor of Science** in Cyber Security from Capitol Technology University. The curriculum included a broad coverage of cybersecurity issues. My dissertation topic was "A Comparative Study of Lattice Based Algorithms for Post Quantum Computing". 4.0 GPA.
- **Ph.D. Doctor of Philosophy** in Technology from Capitol Technology University. The focus of this program was on nanotechnology used in bioengineering. More specifically my studies focused on carbon nanotubes used in bioengineering. Dissertation topic "The Effects of Complexity on Carbon Nanotube Failures". 4.0 GPA.
- **Ph.D. Doctor of Philosophy** in Computer Science from University of Portsmouth in England. The emphasis was on computer networking and the application of applied mathematics. Dissertation topic "A Systematic Framework for Network Forensics Using Graph Theory".

Industry Certifications

The following is a list of engineering and computer industry certifications I have earned.

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 24 of 67

Engineering Certifications

Note: some of these appear also in computer industry certifications

1. Associate of Systems Engineering (ASEP) from INCOSE (International Council on Systems Engineering) 05452.
2. Microsoft Certified Systems Engineer (MCSE) Windows Server 2000 Certification Number: A527-9552
3. EC Council Certified Application Security Engineer - .Net
4. EC Council Certified Application Security Engineer – Java
5. CISSP- ISSEP Information Systems Security Engineering Professional #387731

Hardware and Networking Related Certifications

1. CompTIA (Computer Technology Industry Associations) A+ Certified D76DTT4107
2. CompTIA Network + Certified COMP10163630
3. CompTIA Server+ Certified COMP10163630
4. CompTIA I-Net+ Certified COMP10163630
5. CompTIA Cloud+ Certified COMP001021522764
6. JN0-103 Juniper Networks Certified Associate, Junos JNCIA-Junos
7. CompTIA IT Operations Specialist (CIOS) COMP10163630
8. CompTIA Cloud Admin Professional (CCAP) COMP10163630
9. CompTIA Network Infrastructure Professional – CNIP COMP10163630

Operating System Related Certifications

10. Microsoft Certified Trainer
11. CompTIA Linux + Certified COMP10163630
12. CompTIA Systems Support Specialist (CSSS) COMP10163630
13. CompTIA Linux Network Professional – CLNP COMP10163630
14. CompTIA Secure Infrastructure Specialist (CSIS) COMP10163630
15. Microsoft Certified Professional (MCP) – Windows Server 2000 Professional Certification Number: A527-9546
16. Microsoft Certified Systems Administrator (MCSA) Windows Server 2000 Certification Number: A527-9556
17. Microsoft Certified Systems Engineer (MCSE) Windows Server 2000 Certification Number: A527-9552
18. Microsoft Certified Technology Specialist (MCTS) Windows Server 2008 Active Directory Microsoft Certification ID: 1483483
19. Microsoft Certified Technology Specialist (MCTS) Windows 7 Microsoft Certification ID: 1483483

20. Microsoft Certified IT Professional (MCITP) Windows 7 Microsoft Certification ID: 1483483
21. Microsoft Certified Solutions Associate Windows 7 Microsoft Certification ID: 1483483
22. National Computer Science Academy Windows 8 Certification Certificate #: 4787829

Programming and Web Development Related Certifications

23. Microsoft Certified Professional (MCP) – Visual Basic 6.0 Desktop Applications Microsoft Certification ID: 1483483
24. Microsoft Certified Professional (MCP) – Visual Basic 6.0 Distributed Applications Microsoft Certification ID: 1483483
25. Microsoft Certified Application Developer (MCAD) - C# Microsoft Certification ID: 1483483
26. Microsoft Certified Trainer (MCT 2005-2012) Microsoft Certification ID: 1483483
27. Microsoft Certified Technology Specialist (MCTS) Visual Studio 2010 Windows Application Microsoft Certification ID: 1483483
28. Microsoft Certified Technology Specialist (MCTS) Visual Studio 2010 Data Access Microsoft Certification ID: 1483483
29. National Computer Science Academy HTML 5.0 Certification Certificate #: 4788000.
30. National Computer Science Academy ASP.Net Certification Certificate #: 4788342
31. Certified Internet Webmaster (CIW) Associate CIW0163791
32. EC Council Certified Application Security Engineer - .Net
33. EC Council Certified Application Security Engineer – Java
34. Dynamics 365 Business Central Functional Consultant Associate
35. Microsoft Dynamics 365 Fundamentals Microsoft Certification ID: 1483483
36. Microsoft Certified: Azure AI Fundamentals Microsoft Certification ID: 1483483

Database Related Certifications

37. Microsoft Certified Database Administrator (MCDBA) SQL Server 2000 Microsoft Certification ID: 1483483
38. Microsoft Certified Technology Specialist (MCTS) Implementing SQL Server 2008 Microsoft Certification ID: 1483483
39. Microsoft Certified IT Professional (MCITP) SQL Server Administration Microsoft Certification ID: 1483483
40. DP-203 - Data Engineering on Microsoft Azure

Security and Forensics Related Certifications

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 26 of 67

41. CIW Certified Security Analyst CIW0163791
42. EC Council Certified Ethical Hacker v5 (CEH) ECC942445
43. EC Council Certified Hacking Forensics Investigator v4 (CHFI) ECC945708
44. EC Council Certified Security Administrator (ECSA) ECC947248
45. EC Council Certified Encryption Specialist (ECES)
46. EC Council Certified Instructor
47. CISSP – Certified Information Systems Professional #387731
48. ISSAP – Certified Information Systems Architect #387731
49. CCFP – Certified Cyber Forensics Professional #387731
50. Certified Criminal Investigator (CCI) 2015-2017
51. Forensic Examination of CCTV Digital VTR Surveillance Recording Equipment
52. Oxygen Phone Forensics Certified
53. Access Data Certified Examiner (ACE) 2014-2017
54. OSForensics Certified Examiner (OSFCE)
55. Certified Forensic Consultant (CFC) 2015-2017
56. CompTIA Certified Advanced Security Practitioner (CASP) COMP10163630
57. CompTIA Certified Cybersecurity Analysis (CySA+) COMP001021522764
58. CompTIA Pentest+ COMP001021522764
59. CompTIA Security+ COMP001021522764
60. CompTIA Security Analytics Specialist-CSAP COMP001021522764
61. CompTIA Secure Cloud Professional-CSCP COMP001021522764
62. CompTIA Network Vulnerability Assessment Professional-CNVP COMP001021522764
63. CompTIA Security Infrastructure Expert -CSIE COMP001021522764
64. CompTIA Security Analytics Expert-CSAE COMP001021522764
65. CompTIA Security Network Professional – CNSP
66. JN0-230 – Juniper Security Associate (JNCIA-SEC)
67. JN0-334 – Juniper Security Specialist (JNCIS-SEC)
68. JN0-635 – Juniper Security, Professional (JNCIP-SEC)
69. CISSP- ISSEP Information Systems Security Engineering Professional #387731
70. Certified Cloud Security Professional (CCSP) #387731
71. SC-300 - Microsoft Identity and Access Administrator

Software Certifications

72. National Computer Science Academy Microsoft Word 2013 Certification Certificate #: 5078016

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 27 of 67

73. National Computer Science Academy Microsoft Word 2000 Certification Certificate #: 5078187

Licenses

Texas State Licensed Private Investigator. Registration Number 827827. Associated with Allegiant Investigations & Security License Number: A18596

Publications

Books

1. Easttom, C. (2003). Moving from Windows to Linux. Newton Center, MA: Charles River Learning. 1st Edition, Charles River Media.
2. Easttom, C. & Hoff, B. (2006). Moving from Windows to Linux, 2nd Ed. Newton Center, MA: Charles River Learning. 1st Edition, Charles River Media.
3. Easttom, C. (2003). Programming Fundamentals in C++. Newton Center, MA: Charles River Learning. 1st Edition, Charles River Media.
4. Easttom C. (2002). JFC and Swing with JBuilder 8.0. Plano, Texas: WordWare Publishing.
5. Easttom, C. (2002). JBuilder 7.0 EJB Programming. Plano, Texas: WordWare Publishing.
6. Easttom, C. (2001). Beginning JavaScript, 1st Edition. Plano, Texas: WordWare Publishing.
7. Easttom, C. (2002). Beginning VB.Net. Plano, Texas: WordWare Publishing.
8. Easttom, C. (2001). Advanced JavaScript, 2nd Edition. Plano, Texas: Wordware Publishing.
9. Easttom, C. (2005). Introduction to Computer Security. New York City, New York: Pearson Press.
10. Easttom, C. (2006). Network Defense and Countermeasures. New York City, New York: Pearson Press.
11. Easttom, C. (2005). Advanced JavaScript, 3rd Edition. Plano, Texas: Wordware Publishing.
12. Easttom, C. & Taylor, J. (2010). Computer Crime, Investigation, and the Law. Boston, Massachusetts: Cengage Learning.
13. Easttom, C. (2013). Essential Linux Administration: A Comprehensive Guide for Beginners. Boston, Massachusetts: Cengage Learning.
14. Easttom, C. (2011). Introduction to Computer Security, 2nd Edition. New York City, New York: Pearson Press.
15. Easttom, C. (2012). Network Defense and Countermeasures, 2nd Edition. New York City, New York: Pearson Press.

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 28 of 67

16. Easttom, C. (2013). System Forensics, Investigation, and Response, 2nd Edition. Burlington Massachusetts: Jones & Bartlett.

17. Easttom, C. (2014). CCFP Certified Cyber Forensics Professional All-in-One Exam Guide. New York City, New York: McGraw-Hill Publishing.

18. Easttom, C. & Dulaney, E. (2015). CompTIA Security+ Study Guide: SY0-401. Hoboken, New Jersey: Sybex Press.

19. Easttom, C. (2015). Modern Cryptography: Applied Mathematics for Encryption and Information Security. New York City, New York: McGraw-Hill Publishing.

20. Easttom, C. (2016). Computer Security Fundamentals, 3rd Edition. New York City, New York: Pearson Press.

21. Easttom, C. (2017). System Forensics, Investigation, and Response, 3rd Edition. Burlington Massachusetts: Jones & Bartlett.

22. Easttom, C. & Dulaney, E. (2017). CompTIA Security+ Study Guide: SY0-501. Hoboken, New Jersey: Sybex Press.

23. Easttom, C. (2018). Penetration Testing Fundamentals: A Hands-on Guide to Reliable Security Audits. New York City, New York: Pearson Press.

24. Easttom, C., & Christy, R. (2017). CompTIA Security+ Review Guide: SY0-501. Hoboken, New Jersey: Sybex Press.

25. Christy R., Easttom, C. (2018). CompTIA Security+ Practice Tests: Exam SY0-501. Hoboken, New Jersey: Sybex Press.

26. Easttom, C. & Roberts, R. (2018). Networking Fundamentals, 3rd Edition. Goodheart-Wilcox Publishing.

27. Easttom, C. (2018). Network Defense and Countermeasures, 3rd Edition. New York City, New York: Pearson Press.

28. Easttom, C. (2019). Computer Security Fundamentals, 4th Edition. New York City, New York: Pearson Press.

29. Easttom, C & Johnson, R. (2020). Security Policies and Implementation Issues, 3rd Edition. Jones and Bartlett.

30. Alsmadi, I., Easttom, C., Tawalbeh, L. (2020). NICE Cyber Security Framework Cyber Security Management. Springer Press.

31. Easttom, C. (2020). Modern Cryptography: Applied Mathematics for Encryption and Information Security 2nd Edition. New York City, New York: Springer Press.

32. Easttom, C. (2021). Digital Forensics, Investigation, and Response, 4th Edition. Burlington Massachusetts: Jones & Bartlett.

33. Easttom, C. (2021). Quantum Computing Fundamentals. New York City, New York: Pearson Press.

34. Easttom, C. (2021). An In-Depth Guide to Mobile Device Forensics. CRC Press.

35. Easttom, C. (2021). Certified Ethical Hacker v11 Exam Cram. Pearson

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 29 of 67

Press.

36. Easttom, C. (2022). Networking Fundamentals, 4th Edition. Goodheart-Wilcox Publishing.

37. Easttom, C. (2022). Modern Cryptography: Applied Mathematics for Encryption and Information Security 3rd Edition. New York City, New York: Springer Press.

38. Easttom, C. (2023). Machine Learning for Neuroscience. CRC Press.

39. Easttom, C. (2023). Computer Security Fundamentals, 5th Edition. New York City, New York: Pearson Press.

40. Easttom C., Roberts, R. (2023). Computer Service and Repair, 6th Edition. Goodheart-Wilcox Publishing.

41. Easttom, C. (2023). Network Defense and Countermeasures, 4thEdition. New York City, New York: Pearson Press.

Papers, presentations, & articles.

1. Easttom, C. (2010). RSA and its Challenges. EC Council White Paper.
2. Easttom, C. (2010). Finding Large Prime Numbers. EC Council White Paper
3. Easttom, C. (2010). A Method for Finding Large Prime Numbers. Haking Magazine. Hands-On Cryptography Issue.
4. Easttom, C. (2014). A method for finding large prime numbers. Open-Source Article published by Academia.edu 2014.
5. Easttom, C. (2011). The RSA Algorithm - The ups and Downs. CryptoMagazine.
6. Easttom, C. (2011). Feistel Ciphers - An Overview. Presentation at Cast Security Conference. Washington, D.C.
7. Easttom, C. (2011). Steganography- History and Modern Applications. Presentation at Takedown Security Conference.
8. Easttom, C. (2012). Problems with RSA. Presentation at Takedown Security Conference – Dallas, TX.
9. Easttom, C. (2013). Cryptanalysis. Presentation at Takedown Security Conference. Huntsville, Alabama.
10. Easttom, C. (2014). An Overview of Cryptographic S-Boxes used in Block Ciphers. Research Gate. DOI RG.2.2.14084.94088.
11. Easttom, C. (2014). Cryptographic Backdoors. Presentation at ISC2 Security Congress. Atlanta, Georgia.
12. Easttom, C. (2014). Cryptographic Backdoors. Presentation at University of Texas Dallas ACM Chapter Conference.
13. Easttom, C. (2014). Windows Registry Forensics. Research Gate. DOI

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 30 of 67

RG.2.2.29603.86561

14. Easttom, C. (2014). Artificial Intelligence, Fuzzy Logic, Neural Networks and Fuzzy Neural Networks and their impact on Electronic Medical Records. Academia.edu.
15. Easttom, C. (2014). A Basic Overview of Electro-Magnetic Interference. Academia.edu.
16. Easttom, C. (2014). An Overview of Targeted Malware. Academia.edu.
17. Easttom C. (2014). An Introduction to Mobile Forensics. Academia.edu.
18. Easttom, C. (2015). Cryptographic Backdoors. Academia.edu.
19. Easttom, C. (2015). The History of Computer Crime in America. Academia.edu.
20. Easttom, C. (2015). Spyware Techniques. Academia.edu.
21. Easttom, C. (2015). Recovering Deleted Files from NTFS. Academia.edu.
22. Easttom, C. (2015). Multi-dimensional analysis of cyber-forensic evidence. Academia.edu.
23. Easttom, C. (2016). Spyware coding techniques. Journal of Information Security Science & Digital Forensics (HJISSDF), 1 (1)
24. Easttom, C. (2016). Cryptographic Backdoors – an introduction. Journal of Information Security Science & Digital Forensics (HJISSDF), 1 (1)
25. Easttom, C. (2016). A Look at Spyware Techniques. 2600 Magazine, *33*(3). Autumn issue 2016.
26. Easttom, C. (2016). Multi-Dimensional Analysis of Digital Forensic Evidence. Forensic Examiner Journal, *25* (4).
27. Easttom, C. (2016). Applying Graph Theory to Evidence Evaluation. Research Gate DOI: RG.2.2.23391.0528
28. Easttom, C. (2017). An Overview of Pseudo Random Number Generators. Research Gate. DOI: RG.2.2.13941.58087
29. Easttom, C. (2017). A Model for Penetration Testing. Research Gate. DOI: RG.2.2.36221.15844
30. Easttom, C. (2017). The RSA Algorithm Explored. International Journal of Innovative Research in Information Security. (IJIRIS). 4(1).
31. Easttom, C. (2017). Utilizing Graph Theory to Model Forensic Examination. International Journal of Innovative Research in Information Security (IJIRIS), 4(2).
32. Easttom, C. (2017). Applying Graph Theory to Modeling Investigations. IOSR Journal of Mathematics (IOSR-JM) 13,2 PP 47-51. doi:10.9790/5728-130205475
33. Easttom, C. (2017). Enhancing SQL Injection with Stored Procedures. 2600 Magazine. 34(3).
34. Easttom, C. (2017). An Overview of Key Exchange Protocols. IOSR Journal of Mathematics (IOSR-JM). 13(4). DOI: 10.9790/5728-1304021618.
35. Easttom, C. (2017). An Overview of Quantum Cryptography with Lattice Based

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 31 of 67

Cryptography. IOSR Journal of Mathematics, 13(6).

36. Easttom, C. (2018). A Generalized Methodology for Designing Non-Linear Elements in Symmetric Cryptographic Primitives. In Computing and Communication Workshop and Conference (CCWC), 2018 IEEE 8th Annual. IEEE.
37. Easttom, C. (2018). The role of weaponized malware in cyber conflict and espionage. In 13th International Conference on Cyber Warfare and Security ICCWS, 2018.
38. Easttom, C. (2018) An Overview of Cryptographic Backdoors. Journal of Information System Security, 13 (3), 177-185.
39. Easttom, C. (2018). The Daubert Standard as a Framework for Digital Forensics. Digital Forensics Magazine, 35.
40. Easttom, C. (2018, May). An Examination of Inefficiencies in Key Dependent Variations of the Rijndael S-Box. In Electrical Engineering (ICEE), Iranian Conference on (pp. 1658-1663). IEEE.
41. Easttom, C. (2018, May). A Study of Cryptographic Backdoors in Cryptographic Primitives. In Electrical Engineering (ICEE), Iranian Conference on (pp. 1664-1669). IEEE.
42. Easttom, C. (2018). Bluetooth Hacking 101. 2600 Magazine 35(1).
43. Easttom (2018). An Examination of the Operational Requirements of Weaponized Malware. Journal of Information Warfare 17 (2).
44. Easttom, C. (2018). A Method for Using Historical GPS Phone Records. Digital Forensics Magazine, 36.
45. Easttom, C. (2018). A Systems Approach to Indicators of Compromise Utilizing Graph Theory. 2018 IEEE International Symposium on Technologies for Homeland Security.
46. Easttom, C. (2018). How to model digital forensics investigations with graph theory. Digital Forensics Magazine, 37.
47. Easttom, C. (2019). Conducting Investigations on the Dark Web. Journal of Information Warfare 18 (1).
48. Easttom, C. (2019). An Analysis of Leading Lattice-Based Asymmetric Cryptographic Primitives. 2019 IEEE 9th Annual Computing and Communication Conference.
49. Easttom, C., Butler, W. (2019). A Modified McCumber Cube as a Basis for a Taxonomy of Cyber Attack. 2019 IEEE 9th Annual Computing and Communication Conference.
50. Alsmadi, I, Easttom, C. (2019). The Analysis of Sub-Communities Behavior in Social Networks. American Journal of Science and Engineering, 1(1).
51. Easttom, C. (2019). Integrating Machine Learning algorithms in the Engineering of Weaponized Malware. European Conference on the Impact of Artificial Intelligence and Robotics, Oxford University, England.

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 32 of 67

52. Easttom C. (2019). On the relationship of emergence and non-linear dynamics to machine learning and synthetic consciousness. European Conference on the Impact of Artificial Intelligence and Robotics, Oxford University, England.
53. Easttom, C. (2019). A Methodological Approach to Weaponizing Machine Learning. 4th International Conference on Computer Science and Information Engineering in Beijing China.
54. Easttom, C. (2019). On the Application of the Complexity Zeta Function to Quantify Complexity in Bioengineering Systems. 4th International Conference on Computer Science and Information Engineering in Beijing China.
55. Alsmadi, I, Easttom, C. (2019). Using Maximum Weighted Cliques in the Detection of Sub-Communities' behaviors in OSNs. Proceedings of the Future Technologies Conference 2019.
56. Easttom, C. (2019). SecML: A Proposed Modeling Language for Cybersecurity. IEEE 10th Annual Computing and Communication Conference UEMCON.
57. Easttom, C., Mei, N. (2019). Mitigating Implanted Medical Device Cybersecurity Risks. IEEE 10th Annual Computing and Communication Conference UEMCON.
58. Easttom, C., Sanders, W. (2019). On the Efficacy of Using Android Debugging Bridge for Android Device Forensics. IEEE 10th Annual Computing and Communication Conference UEMCON.
59. Easttom, C. (2020). Mathematically modeling cyber-attacks utilizing engineering techniques 15th International Conference on Cyber Warfare and Security ICCWS
60. Easttom, C., Butler, W. (2020). Applying systems engineering principles to penetration testing. 15th International Conference on Cyber Warfare and Security ICCWS
61. Easttom, C. (2020). On the Application of Algebraic Graph Theory to Modeling Network Intrusions. 2020 IEEE 10th Annual Computing and Communication Conference.
62. Easttom, C., Thapa, S., Lawson, J. (2020). A Comparative Study of Machine Learning Algorithms for Use in Breast Cancer Studies. 2020 IEEE 10th Annual Computing and Communication Conference.
63. Easttom, C. (2020). On the Application of the Complexity Zeta Function to Modelling Complexity and Emergence in Neuro-Engineering. 2020 IEEE 10th Annual Computing and Communication Conference.
64. Easttom, C. (2020). A professional Engineering Approach to Penetration Testing. PenTest Magazine, March 2020.
65. Easttom, C. Adda, M. (2020). An Enhanced View of Incidence Functions for Applying Graph Theory to Modeling Network Intrusions. WSEAS Transactions on Information Science and Applications. DOI: 10.37394/23209.2020.17.12
66. Easttom, C., Ibrahim, A, Chefronov, C., Alsmadi, I., Hanson, R. (2020). Towards a deeper NTRU analysis: a multi modal analysis. *International Journal on Cryptography and Information Security* (IJCIS). 10(2).
67. Easttom, C. Adda, M. (2020) The Creation of Network Intrusion Fingerprints by

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 33 of 67

Graph Homomorphism. WSEAS Transactions on Information Science and Applications. 17(2020). DOI: 10.37394/23209.2020.17.15

68. Easttom, C. (2021). Mathematically modelling victim selection in cybercrimes. 16th International Conference on Cyber Warfare and Security - ICCWS 2021
69. Easttom, C. (2021). A methodology for smart TV Forensics. 16th International Conference on Cyber Warfare and Security - ICCWS 2021
70. Easttom C. (2021). On the Use of the SSIM Algorithm for Detecting Intellectual Property Copying in Web Design. IEEE 11th Annual Computing and Communication Conference.
71. Easttom, C., Adda, M. (2021). Application of the Spectra of Graphs in Network Forensics. IEEE 11th Annual Computing and Communication Conference.
72. Pelosi, M., & Easttom, C. (2021). Identification of LSB image Steganography using Cover Image Comparisons. *Journal of Digital Forensics, Security and Law*, *15*(2), 6.
73. Easttom, C., Butler, W. (2021). The Iran-Saudi Cyber Conflict. International Journal of Cyber Warfare and Terrorism (IJCWT)
74. Easttom, C., Bianch, L, Valeriani, D., Nam, C., Hossaini, A., Zapala, D., Roman-Gonzalez, A., Singh, A., Antonietti, A., Sahonero-Alverez, G., Balachandran, P., (2021). A Functional Model for Unifying Brain Computer Interface Terminology. IEEE Open Journal of Engineering in Medicine and Biology.
75. Easttom, C. (2021, October). Applying Mathematics and Engineering Techniques to Cyber Security. In *Actas del Congreso Internacional de Ingeniería de Sistemas* (pp. e5575-e5575).
76. Easttom, C., Bianchi, L., Valeriani, D., Nam, C. S., Hossaini, A., Zapała, D., ... & Balachandran, P. (2021). A functional BCI model by the P2731 working group: control interface. Brain-Computer Interfaces, 8(4), 154-160.
77. Easttom, C., Alsmadi, I (2022).A Comparative Study of Machine Learning Algorithms for Identifying Mental States from EEG Recordings. IEEE 12th Annual Computing and Communication Conference.
78. Easttom, C. (2022). NTRU & LASH Implemented for Quantum Resistant Blockchain. IEEE 12th Annual Computing and Communication Conference.

Patents

1. U.S. Patent No. 8,527,779 B1 Method and apparatus of performing distributed steganography of a data message.
2. U.S. Patent No. 8,713,067 Stable File System
3. U.S. Patent No. 8,819,827 B1 Method and apparatus of performing data executable integrity verification.
4. U.S. Patent No. 8,825,845 B1 Managing a network element operating on a network.
5. U.S. Patent No. 8,825,810 B1 Domain name service based remote programming objects.
6. U.S. Patent No. 8,984,639 Method and apparatus of performing data executable integrity verification.

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 34 of 67

7. U.S. Patent No. 9,405,907 Method and apparatus of performing data executable integrity verification (a continuation patent of '639)
8. US Patent No. 9,313,167 Domain name service based remote programming objects.
9. US Patent No. 9,619,656 Method and apparatus of performing distributed steganography of a data message (continuation patent of 8,527,779 B1)
10. US Patent No. 9,686,227 Domain Name Service based remote programming objects (continuation patent of U.S. Pat. No. 9,313,167)
11. US Patent No. 9,755,887 Managing a network element operating on a network.
12. US Patent No. 9,754,108 Method and apparatus of performing data executable integrity verification.
13. US Patent No. 9,753,957 System and method for document tracking
14. US Patent No. 9,984,229 Method and apparatus providing a multiple source evidence application trust model.
15. US Patent No. 10,122,573 Managing a network element operating on a network.
16. US Patent No. 10,242,188 Method and apparatus of performing data executable integrity verification.
17. US Patent No. 10,360,354 Method and apparatus of performing distributed steganography of a data message. A continuation patent of U.S. Pat. No. 9,619,656.
18. U.S. Patent No. 10,469,441 Domain name service based remote programming objects. A continuation patent of U.S. Patent 9,686,227.
19. U.S. Patent No. 10,467,208 System and method for document tracking. A continuation patent of U.S. Patent 9,753,957.
20. US Patent No. 10,621,149 Stable File System. A continuation patent of U.S. Pat. No. 8,713,067.
21. U.S. Patent No. 10,635,815 Method and apparatus of performing data executable integrity verification.
22. U.S. Patent No. 10,708,118 Managing a network element operating on a network.
23. U.S. Patent No. 11,080,396 Secure Downloads
24. U.S. Patent No. 11,165,629 Managing a network element operating on a network.
25. U.S. Patent No. 11,204,999 Method and apparatus of performing data executable integrity verification.

Standards and Certification Creation

1. Chair of IEEE P3123 Standard for Artificial Intelligence and Machine Learning (AI/ML) Terminology and Data Formats.
2. Vice Chair of IEEE P23026 - Systems and Software Engineering -- Engineering and Management of Websites for Systems, Software, and Services Information
3. Member of IEEE Software & Systems Engineering Standards Committee.

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 35 of 67

Working on the DevOps 2675 standards group 2017 to 2019.

4. Member of the IEEE Engineering in Medicine and Biology Standards Committee. Standard for a Unified Terminology for Brain-Computer Interfaces P2731 from 2020 to present. I am chairing one of the subgroups.
5. Member of IEEE P2995 - Trial-Use Standard for a Quantum Algorithm Design and Development Standards Group from 2021 to present.
6. Vice Chair of IEEE P3120 - Quantum Computing Architecture Working Group
7. Member of IEEE P3155 QuSIM/WG - Programmable Quantum Simulator Working Group
8. Member of IEEE Artificial Intelligence Standards Group from 2021 to present.

1. Editor in Chief for the *American Journal of Science and Engineering 2017 to 2022*
2. Editorial board for the Journal Artificial Intelligence in Medical Imaging
3. Editorial Review Board for *International Journal of Cyber Warfare and Terrorism (IJCWT)*
4. Reviewer for Journal of Modern Mechanical Engineering and Technology – EBM
5. Reviewer for scientific papers submitted to *IEEE Security & Privacy* and the *IEEE Open Access Journal*.
6. Reviewer for the *International Journal of Network Security (IJNS) 2018-2019*
7. Reviewer for the *International Journal of Computer Science and Security (IJCSS) 2018-2019*
8. Reviewer for the *Journal of Information Warfare (JIW*) for 2019
9. Reviewer for scientific papers submitted to *Digital Forensics magazine* for 2016 to 2018.
10. Editorial board member for the year 2016 for *Journal of Information Security Science & Digital Forensics.*
11. Editorial board for the year 2016 member for *The Forensic Examiner*.
12. Subject matter expert for the Computer Technology Industry Association (CompTIA) Server + exam creation team. I was part of the team that helped create the CompTIA Server+ certification test.
13. Subject matter expert for the Computer Technology Industry Association (CompTIA) Linux+ exam review team. I was part of the team that helped create the CompTIA Linux+ certification test.
14. Subject matter expert for the Computer Technology Industry Association (CompTIA) Security+ exam Job Task Analysis team. I was part of the team that helped create the CompTIA Security+ certification test.
15. Subject matter expert for the Computer Technology Industry Association (CompTIA) Certified Technical Trainer exam revision team.
16. Created the EC Council Certified Encryption Specialist course and certification test. Then revised the course and certification in 2017.
17. Created the EC Council CAST Advanced Encryption course.
18. Created the EC Council advanced forensics courses for Dark Web investigations;

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 36 of 67

Memory and Malware Forensics; and Cell Phone Forensics.

19. Created the EC Council IoT and IoT security courses.
20. Worked on the Job Task Analysis Team for the Certified Ethical Hacker v8 test.
21. Created the video courses for EC-Council CASE (Certified Application Security Engineer) courses for Java and .Net.
22. Member of the advisory board for Embry Riddle University cyber security program within the Homeland Security degree program 2016-2018.
23. Created the OSCFE (OS Forensics Certified Forensic Examiner) course and test.
24. Advisory board committee for your DOE- National Nuclear Security Administration (NNSA)'s solicitation, "Minority Serving Institution Partnership Program (MSIPP), title TAMUK Cybersecurity Minor / Certificate Program for DOE / NNSA Workforce. Texas A&M University Kingsville.

Professional Awards and Memberships

1. Distinguished Speaker of the Association of Computing Machinery (2017 to 2020)
2. Distinguished Visitor of the IEEE Computer Society (for the term of 1 January 2020 through 31 December 2022)
3. Senior Member of the IEEE (Institute of Electronics and Electrical Engineers) #92862378
4. Senior Member of the ACM (Association of Computing Machinery) #0447967
5. Member of the ACM Special Interest Group on Artificial Intelligence
6. Member of the International Association of Cryptological Research (IACR)
7. Member of the ACM Special Interest Group on Security, Audit and Control
8. Member of the IEEE Nanotechnology Society
9. Member of the IEEE Engineering in Medicine and Biology Society
10. Member of the International Council of Systems Engineers (INCOSE) # 275062
11. Affiliate Member of the National Academy of Forensic Engineers
12. Member of the American Physical Society (APS). Member of both the Quantum Information and Nuclear Physics divisions
13. Member of the Association for the Advancement of Artificial Intelligence
14. Associate Member of the American Academy of Forensic Sciences (2015 to 2018)
15. Member of InfraGard (FBI-Civilian group for cyber security) 2013- 2019
16. 1992-1993 National Dean's List
17. Who's Who in American Colleges and Universities 1998
18. Marquis Who's Who in America
19. Marquis Who's Who in Education

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 37 of 67

20. Marquis Who's Who in Science and Engineering
21. Phi Kappa Phi Honor Society # 12618300
22. Gold Key Honor Society #900058595

Speaking Engagements

1. Mid-Cities PC Users Group September 19, 2003. The topic was computer security in general.
2. The Harvard Computer Society April 5, 2004. The topic was computer security.
3. The ACM Chapter of Columbia University November 15, 2005. The topic was computer viruses.
4. DeVry/Keller University in Dallas December 2009 Commencement Speaker.
5. Public presentation on computer crime in McKinney Texas in July 2008.
6. Southern Methodist University Computer Science and Engineering Colloquium September 2010. The topic was organized computer crime and computer terrorism. I was an invited speaker.
7. Takedowncon security conference in Dallas Texas, May 2011. The topic was steganography. I was an invited speaker.
8. An Overview of Modern Cryptography, May 5, 2011, Webinar
9. CAST Conference in Washington D.C. August 2011. The topic was Cryptography: Feistel Ciphers. The audience was primarily Department of Defense personnel and contractors. I was an invited speaker.
10. Digital Certificates: An Expert View, January 12, 2012, Webinar
11. Takedown security conference in Dallas Texas, May 2012. The topic was RSA cryptography. I was an invited speaker.
12. Problems with RSA, November 4, 2012, Webinar
13. Takedowncon security conference in Huntsville Alabama, July 15, 2013. The topic was cryptanalysis. The audience was primarily Department of Defense personnel and contractors. I was an invited speaker.
14. September 25-26, I conducted a 2-day master class in hacking techniques, in Singapore for Clariden Global. I was an invited speaker.
15. March 2014, I conducted a presentation for the University of Texas ACM chapter. The topics were distributed steganography and cryptographic backdoors.
16. May 26-27, 2014. I conducted a 2-day workshop in software testing in Singapore for Clariden Global. I was an invited speaker.
17. June 2014, I conducted a public talk on computer crime and internet safety in Melissa Texas, sponsored by the Melissa Police Department.
18. October 1, 2014, presentation of a talk on cryptographic backdoors at the ISC2 Security Conference in Atlanta Georgia.
19. October 5, 2014, presentation of a talk on cryptographic backdoors at the Hakon convention in Indore, India. I was an invited speaker.
20. October 17, 2014, U.S. Secret Service, North Texas Electronic Crimes (N-TEC) Task Force presenting a talk on the history and current state of computer crime. I was an invited speaker.
21. November 7, 2014, North Texas Crime Commission-Healthcare Cyber Security

Symposium presenting a talk on health care breaches. I was an invited speaker.

22. January 27, 2015: Collin County Sheriff's Academy Alumni Association. "Cybercrime and online predators".
23. April 14, 2015, Brighttalk webinar “What you don’t know about Cryptography and how it can hurt you”.
24. May 4, 2015, North Texas Crime Commission-Healthcare Cyber Security Symposium presenting a talk on the causes and remediation of health care breaches. I was an invited speaker.
25. May 12, 2015, SecureWorld Houston “What you don’t know about Cryptography and how it can hurt you”.
26. August 20, 2015. Southwest Financial Crimes Forum “7 biggest mistakes of incident response.” I was an invited speaker.
27. September 30, 2015, ISC2 Security Congress “Cryptanalysis for Forensics”.
28. October 3, 2015. Conducted a 1-day workshop in Malware at Hakon India. I was an invited speaker.
29. October 4, 2015. Hakon India Indore India. 2015 “Cyberwar and Terrorism”.
30. November 4, 2015, iSMG Fraud Summit in Dallas Texas “Business Email Masquerading: How Hackers Are Fooling Employees to Commit Fraud”. I was an invited speaker.
31. November 5, 2015, SWACHA Electronic Payments Summit in Irving Texas “Emerging Trends in Cyber Crime”. I was an invited speaker.
32. May 25, 2016 “Improving Professional Standards in Cyber Forensics” Keynote speaker for Association of Digital Forensics Security and Law. I was an invited speaker.
33. June 22, 2016, the topic was “Cyber Security Issues Facing Business” Texas Security Bank Business Institute meeting. I was an invited speaker.
34. August 4, 2016 “Steganography: The in’s and Out’s” DefCon 24, Las Vegas.
35. September 12, 2016, USMCOC Third North American Sustainable Economic Development Summit Cyber Security, Information Technology & Innovation Panel. I was an invited speaker.
36. September 13, 2016, Tarleton State University CyberSecurity Summit at the George W. Bush Institute. The topic was "A template for incident response". I was an invited speaker.
37. September 28, 2016, Secure World Dallas. A presentation on "Analyzing Forensic Evidence -Applications of graph theory to forensic analysis”.
38. October 2, 2016, Hakon India (Indore India). A presentation on “The Dark Web Markets – Implications for Law Enforcement and Counter Terrorism”. I was an invited speaker.
39. October 18-19, 2016, Jordan Cyber Security & Forensics Forum (JCSFF-2016) Presenting two presentations. The topics were “Zero Day Exploits” and “How to forensically analyze Zero Day Exploits”. I was an invited speaker.
40. December 1-2. I conducted a 2-day advanced workshop on cyber-threat intelligence in Singapore for Clariden Global. I was an invited speaker.
41. January 17, 2017, the 2nd International Congress of the International Association of Law and Forensic Science (IALFS), in Cairo Egypt January 17, 18, 19. The topics were “Improving Digital Forensics” and “Applying Graph Theory to Model

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013

Forensic Examinations". I was an invited speaker.

42. February 11, 2017. North Texas Cyber Security Association bimonthly meeting. Speaking on Dark Web Markets and their impact for law enforcement and intelligence agencies. Plano Texas Collin College Courtyard Campus.
43. February 17, 2017. American Academy of Forensic Sciences 69th Annual Meeting. Speaking on a novel approach JTAG phone forensics.
44. March 3, 2017. University of North Texas. A presentation on Applying Graph Theory to Analyzing Digital Evidence.
45. May 24, 2017. Enfuse 2017 conference in Las Vegas. A presentation on Applying Graph Theory to Analyzing Digital Evidence.
46. July 27, 2017. Defcon 25 2017 conference in Las Vegas. A presentation entitled "Windows: The Undiscovered Country" on undocumented features of Windows and SQL Server that can be used for hacking and penetration testing.
47. September 25, 2017, ISC2 Security Congress in Austin Texas. A presentation on" Applying Graph Theory to Analyzing Digital Evidence".
48. September 27 and 28, 2017. Secure Jordan conference in Amman. I presented two talks. The first is "An overview of current challenges in phone forensics". The second is "How to address dark web markets".
49. October 18-19 SecureWorld Dallas 2017. A presentation on "Cryptography, what you don't know and how it can hurt you".
50. January 8 to 10th Annual IEEE Computing and Communication Workshop at the University of Nevada in Las Vegas, a presentation on my paper "A Generalized Methodology for Designing Non-Linear Elements in Symmetric Cryptographic Primitives". I also chaired a session on Artificial Intelligence, and another session on Computer Architecture and VLSI.
51. March 8 to 9 ICCWS conference (13th International Conference on Cyber Warfare and Security) presenting my paper "The Role of Weaponized Malware in Cyber Conflict and Espionage". Also presenting a research poster on "A Modified McCumber Cube as a Basis for a Taxonomy of Attacks"
52. March 23, 2018, presenting "Penetration Testing as a Profession Rather than a Dark Art". at the ISC2 Dallas Chapter Meeting in Murphy Texas.
53. April 11, 2018, University of Texas at Dallas ACM chapter is hosting my Distinguished Speaker of the ACM Talk "Quantum Computing and Lattice Based Cryptography."
54. May 7, 2018, Princess Sumaya University for Technology in Amman Jordan hosted my Distinguished Speaker of the ACM Talk "Applying Graph Theory to Digital Forensics."
55. May 17, 2018. SecureWorld Houston 2018. Presentation on "Quantum Computing and Cryptography."
56. May 17, 2018, speaking on "Quantum Computing and Post Quantum Cryptography" at SecureWorld Houston.
57. September 17-19, 2018, I presented presenting "Dark Web Market Investigations" at the San Antonio Techno Security & Digital Forensics Conference
58. September 25, 2018, I presented "Dark Web Market Investigations" at the Global Security Exchange (GSX) 2018 (formerly the Annual Seminar and Exhibits) in Las Vegas Tuesday, September 25, 2018 (11 am Session 5127)

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013

59. October 8-10, 2018 "An exploration of quantum computing and post quantum cryptography" ISC2 Security Congress in New Orleans.
60. October 10-11, 2018, speaking on “Quantum Computing and Post Quantum Cryptography” at SecureWorld Dallas.
61. October 23-24, 2018, IEEE International Symposium on Technologies for Homeland Security. Presenting my paper "A Systems Approach to Indicators of Compromise Utilizing Graph Theory"
62. January 7-9, 2019. On 9 January at 10:30 I was the keynote speaker at the IEEE CCWS conference in Las Vegas presenting a talk on "The impact of complexity and emergent properties on engineering". During the conference I am also presenting my papers "A Modified McCumber Cube as a Basis for a Taxonomy of Cyber Attacks" and "An Analysis of Leading Lattice-Based Asymmetric Cryptographic Primitives"
63. February 11th, an invited talk on “Application of Graph Theory for Digital Forensics” at Seton Hall University.
64. March 7-8, 2019, The International Conference on Data Sciences, Security and Applications (ICDSSA, 2019) Delivering two invited talks: "Overview of Cryptographic Backdoors" and "S-Box Design in symmetric cryptographic primitives" as part of the Distinguished Speakers of the ACM program.
65. March 14-15, 2019. Future of Information and Communication Conference (FICC) 2019 in San Francisco. I presented my Distinguished Speaker of the ACM talk: "Quantum Computing and Lattice Based Cryptography" as an invited keynote speaker.
66. April 4, 2019, Cyberintelligence Summit - Identifying Emerging Threats & Defenses. Fayetteville Arkansas. Speaking on "What Computer Science and Digital Forensics Can and Cannot Do for You in any Case". This is at the University of Arkansas School of Law, Fayetteville, Arkansas.
67. April 5, 2019, Cyberintelligence Summit - Identifying Emerging Threats & Defenses. Fayetteville Arkansas. Speaking on "What Computer Science and Digital Forensics Can and Cannot Do for You in any Case". This is at the Arkansas Bar Center, Little Rock, Arkansas.
68. May 23-24, 2019. ACM Colloquium on Information Assurance, Cybersecurity, and Management CIACAM in Minneapolis. Delivering my Distinguished Speaker of the ACM talk on "Quantum Computing and Lattice Based Cryptography".
69. September 27-28. ICCSIE –International Conference on Computer Science and Information Engineering in Beijing China. Presenting two papers as well as a keynote address "The current state of Quantum Computing"
70. October 11, 2019. Hacker Halted, presenting a talk on "The State of Dark Web Investigations".
71. October 26, 2019, Colloquium on Analytics, Data Science and Computing (CADSCOM 2019). Keynote talk on Quantum Computing and AI.
72. October 28-30. ISC2 Security Congress. Presenting on machine learning and cybersecurity.
73. November 6, 2019. IEEE Quantum Education Summit 2019. Speaking on master’s degree curriculum in quantum computing.

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 41 of 67

74. February 26-27, 2020. 5th International Conference on Quantum and Particle Physics in London, England. Delivering a talk entitled "Space-Time and Gravity as Emergent Quantum Properties."
75. September 2, 2020, National Centers for Academic Excellence invited talk: "Quantum Computing and how it relates to security."
76. September 10, 2020. International IOT, Electronics and Mechatronics Conference Delivering a keynote address "The impact of complexity and emergence on engineering."
77. November 19, 2020. Distinguished Visitor of the IEEE talk on "The impact of Emergence, Nonlinear Dynamics, and Chaos Theory on Engineering."
78. December 18, 2020. US-Korea Conference Sustainable Development & the Future. I am an invited speaker presenting on "Applications of Machine Learning to BCI (Brain Computer Interface)"
79. February 12, 2021. Arizona ISACA Meeting. I spoke on criminal activity on the Dark Web.
80. 24 February 2021. "The Current Status of Quantum Computing" This is an IEEE Distinguished Visitor Program talk presented to the IEEE Region 4.
81. 25 March 2021. "The Current Status of Quantum Computing" This is an IEEE Distinguished Visitor Program talk presented to IEEE Rock River Valley Computer Society chapter and IEEE Rock River Valley Section and IEEE Women in Engineering.
82. 25 April 2021 “Applications of Machine Learning to Cybersecurity” GIDS 2021 conference.
83. September 21, 2021. Delivered a talk on Quantum Resistant Cryptographic Algorithms for the Silicon Valley/SF Bay Area IEEE Computer Chapter.
84. October 5, 2021. Delivered a talk at Hacker Halted on The Impact of Machine Learning on Cybersecurity.
85. October 27, 2021, Keynote speaker at CIIS2021 conference. Delivered a talk on Bringing Mathematical Rigor to Cybersecurity.
86. December 3-5, 2021, Keynote speaker at International Symposium on Automation, Information and Computing (ISAIC 2021) Delivering a talk on Fuzzy logic and its impact on machine learning and AI.
87. October 3, 2022, Speaker at Hacker Halted on the topic of Quantum Computing and its impact on cybersecurity.

Litigation Support Experience

I have worked for both plaintiffs and defendants in computer science related cases. These cases include software copyright, trade secret cases, patent cases, and computer crime related cases. In patent cases I have opined on both infringement and validity issues. I have also testified as to the valuation of computer software.

1. 2004-2005 AVG v. Microsoft, consulting for the firm of McKool Smith on behalf of the plaintiff AVG. This was a patent infringement case involving six patents. I was the testifying expert for one patent (the ‘286 patent) and a

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 42 of 67

consulting expert for the others. This case involved software analysis for several hundred gigabytes of software source code as well as preparation of claim charts. This case concluded.

2. 2006 Harrison v. Comtech Solutions Worldwide Inc., consulting for the firm of Winthrop & Weinstein on behalf of Comtech Solutions. This was a software copyright infringement case. I was a consulting expert for this case.
3. 2006 The Weidt Group v. Cold Spring Granite Company, consulting for the firm of Winthrop & Weinstein on behalf of The Weidt Group. This was a software copyright infringement case. I was a consulting expert for this case. This case concluded.
4. 2008 Countryman v. NextMedia Inc., consulting for the firm Siebman, Reynolds, Burg, & Phillips on behalf of the plaintiff, Countryman. This case involved an alleged breach of network security. I was a testifying expert, the case settled before trial.
5. 2008-2009 Virnetx v. Microsoft, consulting for firm of McDermott, Will, and Emery on behalf of the plaintiff Virnetx. This was a patent infringement case. This case involved software analysis for several hundred gigabytes of software source code. I was a consulting expert for this case. The case went to trial in 2010.
6. Virnetx v Apple, case 6:10-cv-00417 consulting for firm of McDermott, Will, and Emery on behalf of the plaintiff Virnetx. This was a patent infringement case. This case involved software analysis for several hundred gigabytes of software source code. I was a consulting expert for this case.
7. 2010 SSL Services LLC v. Citrix Systems Inc., consulting for the firm of Dickstein and Shapiro LLC on behalf of the plaintiff SSL Services. This was a patent infringement case. I was a consulting expert for this case. Case No. 2-08-cv-158 (E.D. Tex.).
8. 2009-2012 Uniloc v. multiple defendants, consulting for the firm of Ethridge Law Group on behalf of Uniloc. This was a patent infringement case. I consulted and performed the analysis of over 100 potential defendants, determining if the products in question infringed. This involved analyzing the software utilizing standard network forensics techniques as well as reviewing source code. The case also required me to prepare over 100 claim charts. Case numbers including No. 6:14-cv-00415 (E.D. Tex.) (ArcSoft, Inc.), No. 6:14-cv-00420 (E.D. Tex.) (Canon U.S.A., Inc.), No. 6:14-cv-00424 (E.D. Tex.) (Embarcadero Technologies, Inc.).
9. 2011-2012 Virnetx v. Cisco et. al.; Virnetx v Mitel, et. al., consulting for the firm of McKool Smith on behalf of Virnetx. This was a patent infringement case. I was a consulting expert for this case. This case involved software analysis for over 20 gigabytes of software source code for various Cisco products. I also worked on the related Alcatel case and reviewed source code for those products as well. Case No. 6:10-cv-00417 (E.D. Tex.)
10. 2011 Parallel Networks v. Abercrombie & Fitch, multiple defendants, and multiple law firms on behalf of approximately 80 defendants. This was a patent infringement case. Most of the defendants I was working on behalf of won summary judgement Case No. 6:10-cv-00111 (E.D. Tex.). This case

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 43 of 67

concluded.

11. 2011 Nuance v. Vlingo, consulting for the firm of Hays, Bostic, & Cronnin, on behalf of Vlingo. This was a patent infringement case. I was a consulting expert for this case that involved extensive source code review. Case No. 1:09-cv-11414 (D. Mass.). This case concluded.
12. 2011 Eolis v. Adobe Systems Inc., et al., Consulting for the firm of Locke, Lord, Bissel, and Liddell on behalf of defendant Citibank. This was a patent infringement case. I was a consulting expert for this case. Case No. 6:09-cv-00446 (E.D. Tex.).
13. 2012 Smartphone case v. Apple on behalf of the firm of Hayes, Bostic, and Cronin on behalf of Smartphone. This was a patent infringement case. I was a consulting expert for this case. As part of my work on this case I reviewed Apple iOS source code. Case No. 6:13-cv-00196 (E.D. Tex.).
14. 2012 Smartphone case v. Android (HTC and Sony) on behalf of the firm of Nelson, Bumgardner, and Castro on behalf of Smartphone. This was a patent infringement case. I was a consulting expert for this case. As part of my work on this case I reviewed source code for several Android based phones. Case No. 6:10-cv-00580 (E.D. Tex.).
15. 2012-2013 Market One Models v. Tekcenture. For the plaintiff. This was a software copyright infringement case. This case also involved valuation of software and intellectual property. I was a testifying expert in this case. The case was settled during trial. Dallas County CAUSE NO. CC-10-05682-A.
16. 2012-2013 Allstate v. Nationwide consulting for the firm Banner & Whitcoff, on behalf of AllState. This was a patent infringement case; I was a consulting expert for this case. My work on this case involved software source code review for insurance applications. The case was settled before trial. Case No. 1:12- cv-03609 (N.D. Ill.).
17. 2012 Unified Messaging Solutions LLC v. Facebook Inc., Google Inc., Intuit, etc. consulting for the firm of Nelson, Bumgardner, and Castro on behalf of Unified Messaging Solutions LLC. This was a patent infringement case. I was a consulting expert for this case. This case involved extensive software source code analysis. Cases No. 6:11-cv-00120 (E.D. Tex.) (Facebook), No. 6:12-cv-00085 (E.D. Tex.) (Intuit), No. 6:11-cv-00464 (E.D. Tex.) (Google).
18. 2012- 2013 DN Lookup Technologies v. Charter Communications et. al. Consulting for the firm of Lee, Jorgensen, Pyle & Kewalraman on behalf of DN Lookup Technologies. This was a patent infringement case. I was a consulting expert for this case. Case No. 1:11-cv-01177 (D. Del.).
19. 2013 Droplets v. Amazon, et al Consulting for the firm of Wilson, Sonsini, Goodrich, & Rosati on behalf of the defendants E-Trade, Charles Schwab, Ameritrade, and Scottrade. This was a patent infringement case. I was a consulting expert for this case. The case was settled before trial. Case No. 3:12-cv- 03733 (N.D. Cal.).
20. 2013 Andrews v. Medical Excesses LLC. Consulting for the firm of Maynard, Cooper & Gale on behalf of the defendant. This was a liability case involving a breach of network security. The case was settled before trial. Case No. 2:11-cv- 1074 (M.D. Ala.).

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 44 of 67

21. 2013 Macro Niche Software, Inc., and Michael j. Ruthemeyer v. 4 Imaging Solutions, L.L.C., Protech Leaded Eyewear, Inc. And Imaging Solutions of Australia consulting for the firm of Kevin R. Michaels, P.C on behalf of the plaintiff. This was a software copyright infringement case. This case also involved valuation of software and intellectual property. I was a testifying expert in this case. The case was settled before trial. Case No. 4:12-cv-2292 (S.D. Tex.).
22. 2013 Geotag v. Frontier Communications et al. Consulting for the firm of Reese, Gordon, & Marketos on behalf of the plaintiff. This was a patent infringement case involving multiple defendants. I was a testifying expert in this case. The case involved extensive source code and product analysis. The cases settled before trial. Case No. 2:10-cv-00265 (E.D. Tex.).
23. 2013-2014 Geotag v. Starbucks et al. Consulting for the firm of Reese, Gordon, & Marketos on behalf of the plaintiff. This was a patent infringement case involving multiple defendants. I was a testifying expert in this case. The case involved extensive source code and product analysis. The cases settled before trial. Case No. 2:10-cv-00572 (E.D. Tex.).
24. 2013-2014 Geotag v. AT&T et al. Consulting for the firm of Malouf & Nockels LLP and the Winstead law firm, on behalf of the plaintiff. This was a patent infringement case. I was a testifying expert in this case. The case involved extensive source code and product analysis. The case was settled before trial. Case No. 3:13-cv-00169 (N.D. Tex.).
25. 2013 MCNE, Inc. and David Todd McGee v Amarone Partners LLC, et. al. District Court of Dallas County. Consulting for the firm of Howie Law PC on behalf of the defendant. This was a software copyright infringement case. I was a testifying expert in this case, but the case settled before trial. Case Dallas County, Texas DC-11-03860.
26. 2013 PiNet v. J.P. Morgan Chase. Consulting for the firm of Puziniak Law Office on behalf of the plaintiff. This was a patent infringement case. I was a testifying expert on invalidity issues. The case was settled before trial. Case 1:12- cv-00282 (D. Del.).
27. 2013. Future Ads LLC v. Gillman, No. SACV13905DOCJPRX.
28. 2014 Pragmatus Telecom LLC v Volkswagen Group of America. Working for the defendant on behalf of the firm Locke Lord LLP. I was a consulting expert. The case was settled before trial. Case 1:12-cv-01559 (D. Del.).
29. 2014 API Technical Services LLC vs Anthony Francis et. al. working for the defendant on behalf of the Wade Law Firm. I was a testifying expert in this case, the case settled before trial. Case 4:13-cv-627 (E.D. Tex.).
30. 2014 Ameranth, Inc. v. Genesis Gaming Solutions, Inc., for the defendant Genesis Gaming Solutions. This was a patent infringement case. I was a testifying expert in this case, the case settled before trial. This case was in the Central District of California. Case 8:13-cv-00720 (C.D. Cal.).
31. 2014 Ameranth, INC v. ITCS INC., for the defendant ITCS. This was a patent infringement case. I was a testifying expert in this case, settled before trial. This case was in the Central District of California SA 8:13-00720 AG. Case 8:13-cv-00720 (C.D. Cal.).

32. 2014 Neomedia Inc. vs Dunkin Brands Inc. Civil Action No.: 13-cv-02351-RM-BNB. I was retained by the firm of Nutter law on behalf of the defendant Dunkin Brands Inc. The case was settled before trial. Case 1:13-cv-02351 (D. Colo.).
33. Neomedia v Marriott Intl. Inc. Civil Action No. 14-cv-001752-KLM. I was retained by the firm of Ballard Spahr LLP for the defendant. The case was settled before trial. Case 1:13-cv-001752 (D. Colo.).
34. 2014 Federal Trade Commission vs Boost Software Inc. for the defendant. Case 14-cv-81397 (S.D. Fla.). The case concluded at trial.
35. 2014 Federal Trade Commission vs PC Cleaner Pro Inc. for the defendant. Case 14-cv-81395 (S.D. Fla.). The case concluded at trial.
36. 2015 E AutoXchange LLC vs Academy, LLC. I was retained on behalf of the defendant for the law firm of Wolfe & Wyman LLP. This was a software copyright infringement case. Case 1:14-cv-01278. The case was settled.
37. 2015 Attorney General of Florida v ASAP Tech Help LLC, Working for the firm of Lubell & Rosen for the defendant. This case was settled before trial. Case 2015 CA002751XXXXMB. Case concluded.
38. 2015 SNA1 S.p.A. v Barcrest Group Ltd. For the firm of Winget, Spadafora, & Schwartzberg on behalf of Illinois Insurance Company. I was a consulting expert. The case was settled.
39. 2015 Suncoast Post-Tension LTD vs Peter Scoppa, et. al. US District Court Houston. For the firm of Macdonald Devin P.C., on behalf of the defendant. Case No. 4:13-cv-03125. Case concluded.
40. 2015-2017 Walmart Stores Inc. v. Cuker Interactive LLC. for the Henry Law Firm on behalf of Cuker Interactive LLC. Software trade secrets is the underlying matter in the case. Case has concluded.
41. 2015 United States of America vs. Anastasio N. Laoutaris. District Court for the Northern District of Texas, Dallas Division case no 3:13-CR-00386-B. Working for the firm of Law Office of John R. Teakell on behalf of the defendant. This was a criminal case involving alleged violation of 18 U.S.C. 1030 (a)(5)(A) and (c)(4)(B)(i). Case concluded at trial.
42. 2016 VPN Multicast Technologies LLC vs AT&T Corp., Civil Action No.: 3:15-cv-02943-M. Patent infringement case. For the firm of The Simon Law Firm on behalf of the plaintiff. This case was settled.
43. 2015-2016 Bradium Technologies vs Microsoft Cause 35:27 Patent infringement case. For the firm of Kenyon & Kenyon LLP on behalf of the plaintiff. This case was settled.
44. 2016 United States v Michael Thomas. Eastern District of Texas Sherman Division Case No 4:13CR227. For the firm of Tor Ekeland, P.C. on behalf of the defense. Case concluded at trial.
45. 2016 Motio Inc. v. BSP Software LLC, Brightstar. United States District Court for the Northern District of Texas Dallas Division Civil Action No. 3:16-cv-00331-O. For the firm of Walsh Law on behalf of the plaintiff. The case was settled.
46. 2016-2017 Sanders et. al. v. Knight et. al. For the firm of Bradley, Murchison, Kelley, and Shea. This case has settled.

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 46 of 67

47. 2016-2017. Suzanne Zacharius vs Kensington Publishing. Supreme Court of the state of New York. Index No. 652460/2012. Hired by the firm of Fox Rothschild LLP, for the defendant. This case has settled.
48. 2016 – 2017 Thomas Sisoian v. IBM. United States District Court for the Western District of Texas Austin Division Case No. 1-14-CV-565-SS. For the firm of DiNovo Price Ellwanger & Hardy LLP on behalf of the plaintiff. This case was settled.
49. 2016 – 2017 Evicam International, Inc. v. Enforcement Video, LLC, d/b/a WatchGuard Video. US District Court for the Eastern District of Texas, Sherman Division Case No. 4:15-cv-00105-ALM. For the firm of Reese, Gorden, and Marketos on behalf of the defendant WatchGuard Video on the topic of patent invalidity. The case has concluded at trial.
50. 2016 – 2018 Various patent cases on behalf of Uniloc USA with the law firms of Prince Lobel and Tyre as well as the Ethridge Law Group. The cases have included Uniloc USA v Cisco Systems Inc. Civil Action No. 6:15-cv-1175; Uniloc USA v Facebook Inc. Civil Action No. 6:15-cv-223; Uniloc USA Inc. v Apple Inc. Case No.: 4:18-cv-00362-PJH; Huawei, Facebook, and others. The cases I worked on have settled or are suspended.
51. 2017-2018. Bascom Global Internet Service Inc., v AT&T Corp. Case No. 3:14-CV-3942-M. I was hired by the firm of Susman Godfrey LLP to be the plaintiff. This case has settled.
52. 2017-2018. Dale Oliver v Bruce Johanson, Blair Johanson, and DB Squared LLC. United States District Court for the Western District of Arkansas, Fayetteville Division. Case No. 5:17-cv-05129-TLB. Hired by the Mark Henry Law firm for the defendant/counter claimant. The case included software copyright matters. This case has been tried.
53. Uniloc vs Samsung Case No. 2:17-cv-00651-JRG in the Eastern District of Texas, Marshall Division. This case has settled.
54. 2017-2018. Kathy Whitinger v Gurjit Singh Dhillon, C.H. Robinson Worldwide, Inc. District Court of Lincoln County State of Oklahoma. Case No. CJ-2013-120. Hired by the firm of Kane, Russell, Colman, and Logan PC for the defendant. This case was settled.
55. 2017-2018. John M. Money, LLC dba Auditors Recovery Service v. AmWins Specialty Auto, Inc. Cause No. DC-16-05483 101st Judicial District Court, Dallas County Texas. Hired by the firm of Kessler Collins for the defendant. This case was settled.
56. Neutral forensic expert, working for the court (not for a particular party) in the matter of Mallory Pounds, et al. v. Joshua Freise, et al. This case has settled.
57. Array Technologies Inc. vs. Mitchell, NextTracker, et al., United States District Court for the District of New Mexico. Case No. 1:17-cv-00087-JAP-LF. Retained on behalf of Array Technologies Inc. regarding security of trade secrets. This case has settled.
58. Luminati Networks Ltd. vs. Biscience inc. In the United States district court for the eastern district of Texas Marshall Division civil action no. 2:18-cv-483- jrg. Patent validity issue. The case was settled.
59. Beaton v SpeedyPC Software. Case No. 1:13-cv-08389 United States District

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 47 of 67

Court Northern District of Illinois, Eastern Division. Retained on behalf of Beaton. This case has settled.

60. Randy L. Rasmussen, Andre Gerard, Thomas Collier, and Mark E. Millwee vs Texas Children's Hospital. Civil Action No. 4:19-cv-00268 Southern District of Texas Houston Division. I was hired by the defendant to opine on computer industry certifications. The case was settled before trial.
61. Adams Wealth Advisors, LLC, et al., vs Tanner Dance et al. Case No. 20010002 First Judicial District Court Cache County, Utah. I was hired by the firm of Maschoff Brennan on behalf of the defendant to perform digital forensic analysis. The case was settled before trial.
62. Madison inc. vs. Lederer. I was hired by the plaintiffs to perform digital forensics investigations. This case has settled.
63. Mid America Mortgage, Inc. Red Rock Mortgage, vs. Kelly Grigs, Greg Mahaney, and Interlinc Mortgage Services LLC. Hired by Kessler Collins P.C. on behalf of the plaintiff. This case concluded.
64. Uniloc 2017 LLC v. Samsung Electronics Civil Action No. 2:18-cv-508 (JRG- RSP) United States District Court for the Eastern District of Texas Marshall Division. Retained on behalf of Uniloc. Case settled.
65. Ida Marie Estrada vs. HEB LP Cause No. C-4093-18-J. Retained on behalf of Ida Marie Estrada by the Acevedo Law Firm, PLLC, to perform forensic analysis of security videos. This case has settled.
66. Gardiner v. Walmart Inc. et al Case 4:20-cv-04618. I was hired by the firm of Wilshire Law Firm, PLC to determine if Walmart customer data was for sale on the Dark Web, and if it appeared Walmart had been breached.
67. Uniloc 2017 LLC v Motorola Mobility LLC United States District Court Delaware case 1:18-cv-01844-RGA-SRF. Retained on behalf of Uniloc. This case is stayed.
68. Integrated Dentistry, P.A. v. Integrative Dental Specialists, Pllc, In the United States District Court for The Western District of Arkansas Fayetteville Division Case 5:19-CV-05090 Hired by Henry Law firm on behalf of the plaintiff. This matter has settled.
69. Icon Health & Fitness, Inc. v. Peloton Interactive, Inc. In The United States District Court for The District of Delaware. Hired by the firm of Mashoff Brennan on behalf of the plaintiff.
70. WHEREVERTV, INC. v. Comcast LLC. United States District Court of Florida, Ft. Myers Division. Hired by the firm of Reese, Marketos, LLP on behalf of the plaintiff. Case concluded at trial.
71. The Douglas Stewart Company v. HIQO Solutions. US District Court for the Southern District of Georgia Civil Action: 4:20-cv-00101-WTM_CLR. Hired by the firm of Lewis Brisbois for the defendant. This case has settled.
72. Maritz Holdings Inc., V Certain Underwriters at Lloyd's London Subscribing to Policies Numbered B122fi0115115 and Fi0115116, Et Al., United States District Court for The Eastern District of Missouri Eastern Division Case No. 4:18-cv-00825-RWS. Hired by the firm of Lewis Rice on behalf of the defendant. This case has settled.
73. Huawei Technologies Co., LTD vs Verizon Communications. In the United

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 48 of 67

States District Court Western District of Texas Waco Division. Civil Action No. 6:20-cv-00090. Hired by the firm of Fish & Richardson P.C. on behalf of Huawei. This is a patent infringement case. This case has settled.

74. Callrail, Inc. v. Phonewagon, Inc., et al. Litigation. US District Court for the Northern District of Georgia No. 1:18-cv-02207-AT. Hired by the firm of Lewis Brisbois for the defendant. This case involves code analysis. This case has settled.
75. Vault Data, LLC Vs Karl J. Cama Cause No. 153-307467-19. Hired by the firm of Friedman, Suder & Cooke for the defense. This case has settled.
76. CyberX Group, LLC, And David E. Lindsey Vs. Christopher Pearson, CyberX, LLC, Troy Van Zile, Pearson Holdings, Inc., Operation 29, LLC, Landon Jordan, Graford Business Management, LLC, And Vzlivin LLC. Northern District of Texas Dallas Division Case No. 3:20-cv-2501-B. Hired by the firm of Platt Cheema Richmond PLLC, for the plaintiff. This case involved code analysis. This case has settled.
77. Louisiana Workers' Compensation Corporation vs Insurity Inc. Case No: 1-19-0004-2033. Hired by the firm of Nixon Peabody LLP, for the defendant. This case involved code analysis. This case was concluded at arbitration.
78. Hunter Aldridge v. Kenny Nation, et al. Hired by the Simon Law firm for the Defendant. This case involves phone forensics. This case has settled.
79. Sopris Systems, LLC V South Texas Electric Cooperative, Inc Cause No. 19-05-84418-B Hired by the firm of Carter Arnett for the Plaintiff. This case has settled.
80. Pro Marketing Sales, Inc. Vs. Secturion Systems, Inc.; And Richard J. Takahashi, United States District Court for The District of Utah Case No. 1:19-cv-00113. Hired by the firm of Ray Quinney & Nebeker on behalf of the defense. This case involves ownership of patents including both source code analysis and computer chip analysis.
81. Cisco Systems, Inc. and Cisco Technology, Inc., V Jedd Williams. Hired by McDermott, Will, and Emory for the defense. This case was settled.
82. Hasko Trading Inc V Agro LLC. Cause No. 20-09227 In the District Court 68th Judicial District Dallas County Texas. Hired by the Law Office of Paul Clevenger for the Plaintiff. This case was settled.
83. Appian Corporation v Pegasystems Inc. and Mr. Youyong Zou. This case is in the Circuit Court of Fairfax County Virginia, Civil Action No. 2020 07216. Was retained by the firm of Choate, Hall & Stewart LLP on behalf of the defendant. This case involved alleged theft of trade secrets. This case concluded at trial.
84. CPC Patent Technologies PTY LTD, v. Apple Inc. This case is in the Western District of Texas Waco Division Case No. 6:21-cv-00165-ADA. I was retained by the firm of K&L Gates LLP on behalf of the plaintiff. This is a patent case. This case involves both source code analysis and computer chip/CPU analysis.
85. CPC Patent Technologies PTY LTD, v. HMD Inc. This case is in the Western District of Texas Waco Division Case No.6:21-cv-00166-ADA. I was retained by the firm of K&L Gates LLP on behalf of the plaintiff. This is a

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 49 of 67

patent case. This case involves both source code analysis and computer chip/CPU analysis.

86. Peloton Interactive, Inc. vs. iFIT INC. In The United States District Court for the District of Delaware C.A. No. 1:20-cv-1535. I was hired by the firm of Foley & Lardner LLP on behalf of the defendant. The defendant won summary judgement in this case.
87. Allscripts Healthcare, LLC. v Andor Health LLC US District Court of Delaware C.A. No. 1:21-cv-00704-MAK. This case involves cloud computing (Azure) and allegations of computer intrusions. This case was settled.
88. Todd Rands vs Jason T. Saur Circuit Court of St. Louis County, State of Missouri Cause No. 20SL-CC00536. Hired by the firm of Simon Law on behalf of the plaintiff. This case involved phone forensics. The case concluded.
89. Soter Technologies, LLC v. IP Video Corporation, et al. This case was in the United States District Court Eastern District of New York. Civ. No. 2:20- cv-02989(GRB)(AKT). I was hired by the firm of Chiesa Shahinian & Giantomasi PC on behalf of the plaintiff. This case concluded.
90. Boxcast Inc. v Resi Media LLC. This case is in the United States District Court Eastern District of Texas Marshall Division Civil Action No. 2:21-cv-00217. I was hired by the firm of Munck, Wilson, Mandala on behalf of the defendant. This is a patent case. The two patents in the suit were rendered invalid by the PTAB.
91. Walter Peters v Apple Inc. Case No. 19STCV21787. This case involves cybersecurity and open source intelligence.
92. Arkeyo, LLC vs Saggezza INC Northern District of Illinois Case No. 19-cv-08112. I was hired by the firm of Jayaram on behalf of the defendant. The case involves allegations of software copyright infringement and trade secrets misappropriation.
93. F45 TRAINING PTY LTD vs BODY FIT TRAINING USA INC., Hired by the firm of Willkie Farr & Gallagher LLP for the defendant. This is a patent infringement case. US District Court of Delaware C.A. No. 20-1194-WCB. Defendant won summary judgement.
94. Cisco v Wilson Chung, Poly, CASE NO. 4:19-cv-07562-PJH Northing District of California-Oakland. Hired by the firm of McDermott, Will, and Emery on behalf of the defendant. The case involves digital forensics and trade secrets. The defendant won summary judgement.
95. James Feliciano Vs BLC Abstract & Title, LLC A/K/A Ellyson Abstract Ellyson Abstract & Title Co. LLC District Court of Brewster County, Texas. Hired by the plaintiff. The case involved cybersecurity and digital forensics. Case has settled.
96. Brian M. Douglas & Associates, LLC V Conquest Solutions, LLC, In the State Court of Cobb County State of Georgia Civil Action File No 21-A-2215. This Is a Cybersecurity Case. Hired By the Firm of Hill Kertscher & Wharton LLP.
97. Healthcare Advanced Risk Technologies, Inc., And Inspirien Holding

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 50 of 67

Corp., V Terence Mills, Ai.Io Corp., Jane Nemcova, And Veuu, Inc., United States District Court Eastern District Of New York Case No.: 2:22-cv-04192-JS-AYS. This is a software copyright and trade secrets case. I was hired by the firm of Fox Rothschild on behalf of the plaintiff. The case was settled before trial.

98. James Feliciano V BLC Abstract & Title, LLC hired by the Johnson Law Firm on behalf of the plaintiff, case settled.
99. Anyplace Management and Diagnostics, Inc. D/B/A Anyplace Md, Healthcare Billing Solutions, Inc., In the United States District Court for The Western District of Texas Austin Division Vs Anyplace Management and Diagnostics, Inc. D/B/A Anyplace Md, Healthcare Billing Solutions, Inc., Civil Action No. 1:22-Cv-353-Ly Hired by the Farrell Law Group. This is a cybersecurity case. The case was settled.
100. Jacqueline Delling vs R & C Transportation, LLC and Michael Wilkinson State of Missouri Cause No. vs. 21SL-CC03800. Hired by the firm of Simon Law Firm on behalf of the plaintiff. The case involved forensics examination of cell phone records.
101. Cardware Inc. vs. Samsung Electronics Co., Ltd. And Samsung Electronics America, Inc., In the United States District Court for The Eastern District of Texas Marshall Division Case No. 2:22-Cv-00141-Jrg-Rsp hired by the firm of Shearman & Sterling LLP on behalf of the plaintiff.
102. Juul Labs, Inc. Antitrust Litigation United States District Court Northern District of California Case No. 3:20-Cv-02345-Who Hired by The Firm of Joseph Saveri Law Firm, LLP on behalf of the plaintiff.

Testifying Experience

I have testified at 62 depositions (in addition I have testified at 11 trials, 2 arbitrations, and 8 hearings. Specifics are listed below.

1. May 11, 2023, my deposition was taken in the matter of Brian M. Douglas & Associates, LLC V Conquest Solutions, LLC.
2. April 18 through April 25th, 2023, I tested in the trial of WhereverTV vs Comcast on both patent infringement and invalidity. United States District Court of Florida, Ft. Myers Division.
3. April 13, 2023, my deposition was taken in the matter of Jacqueline Delling vs R & C Transportation, LLC and Michael Wilkinson State of Missouri Cause No. vs. 21SL-CC03800.
4. April 4, 2023, my deposition was taken in the matter of IPR2022-00600 Apple Inc. v. CPC Patent Technologies PTY LTD. I was retained by CPC Patent Technologies.
5. February 2023, my deposition was taken in the matter of IPR2022-00601 and IPR2022-00602 Apple Inc. v. CPC Patent Technologies PTY LTD. I was retained by CPC Patent Technologies.

6. January 30, 2023, my deposition was taken in the matter of CPC Patent Technologies PTY LTD, v. HMD Inc. regarding validity issues.
7. January 12, 2023, my deposition was taken in the matter of CPC Patent Technologies PTY LTD, v. HMD Inc. regarding infringement issues.
8. November 14, 2022, my deposition was taken in an IPR related to Boxcast INC. v. Resi Media LLC.
9. October 19, 2022, my deposition was taken in the matter of Cisco v Wilson Chung/Poly.
10. September 8, 2022, my deposition was taken in the matter of Arkeyo, LLC vs Saggezza.
11. August 31, 2022, my deposition was taken in the matter of F45 TRAINING PTY LTD vs BODY FIT TRAINING USA INC.,
12. July 14, 2022, my deposition was taken in an IPR related to Boxcast INC. v. Resi Media LLC.
13. June 21 and June 22, 2022, I testified at a Markman hearing in the matter of WHEREVERTV, INC. v. Comcast LLC.
14. June 13, 2022, my deposition was taken in the matter of Walter Peters v. Apple Inc. Case No. 19STCV21787.
15. May 2, 2022, I testified in the trial of Appian Corporation v Pegasystems INC. and Mr. Youyong Zou
16. May 1, 2022, my deposition was taken in the matter of Allscripts Healthcare, LLC. v. Andor Health
17. March 24, 2022, my deposition was taken in the matter of Hunter Aldridge v. Kenny Nation. The case involves phone forensics.
18. March 11, 2022, my deposition was taken regarding pre-sale bar in the matter Boxcast Inc. v Resi Media LLC.
19. March 10, 2022, my deposition was taken in the case of Todd Rands vs Jason T. Saur Circuit Court of St. Louis County, State of Missouri No. 20SL-CC00536. The case involves phone forensics.
20. February 18, 2022, my deposition was taken regarding claim construction in the matter Boxcast Inc. v Resi Media LLC.
21. January 17, 2022, I testified in the arbitration hearing in the matter of LWCC vs Insurity.
22. January 15, 2022, my deposition was taken in the matter of Appian v Pegasystems.
23. January 5, 2021, my deposition was taken in the matter of Boxcast INC. v Resi Media LLC.
24. December 22, 2021, my deposition was taken in the matter of Peloton vs. iFit regarding trade secrets.
25. November 5, 2021. I testified in an arbitration hearing in the matter of

Cuker v. Pillsbury, Winthrop, Shaw, Pittman. AAA CASE NO. 01-18- 0001-5005

26. November 1, 2021, my deposition was taken in the matter of IPR2021-00342 Petition
27. October 15, 2021, my deposition was taken in the matter of OnQuest Concierge LLC vs App Quest Technologies LLC, et al., hired by the firm of Platt Cheema Richmond PLLC on behalf of the plaintiff.
28. September 17, 2021, my deposition was taken in the matter of Cisco v Williams.
29. July 27, 2021, my deposition was taken in the matter of WhereverTV vs Comcast.
30. July 7, 2021, my deposition was taken in the matter of The Douglas Stewart Company v HIQO Solutions.
31. July 5, 2021, my deposition was taken in the matter of Huawei vs. Verizon.
32. December 21, 2020, I testified at a hearing in the matter of Icon Health & Fitness, Inc. v Peloton Interactive, Inc.
33. November 18, 2020, my deposition was taken in the matter of Icon Health & Fitness, Inc. v Peloton Interactive, Inc.
34. November 10, 2020, my deposition was taken in the matter of Mid America Mortgage, Inc. Red Rock Mortgage, vs. Kelly Griigs, Greg Mahaney, and Interlinc Mortgage Services LLC.
35. September 1, 2020, I testified in an evidentiary hearing in the case of Madison inc. v Lederer.
36. July 14, 2020, my deposition was taken in the matter of Ida Marie Estrada vs. HEB LP Cause No. C-4093-18-J.
37. My deposition was taken on April 1 & 2, 2020. My deposition was taken in the matter of Uniloc 2017 LLC v. Samsung Inc. Case No. 2:18-cv-00508-JRG.
38. February 25, 2019, my deposition was taken in the matter of Uniloc 2017 vs Samsung Civil Action No. Case No. 18-cv-00506.
39. December 12, 2019, my deposition was taken in the matter of Uniloc 2017 LLC v Motorola Mobility LLC.
40. June 25, 2019, my deposition was taken in the matter of Array Technologies Inc. vs. Mitchell, NextTracker, et al.,
41. January 10, 2019, my deposition was taken on the matter of IPR2018-00361.
42. December 20 & 21, 2018 my deposition was taken in the matter of Uniloc v Samsung, Civil Action No. 2:17-cv-651-JRG on patent infringement and validity issues.
43. October 12, 2018. My deposition was taken in the matter of IPR2018-00294.
44. September 21, 2018. My deposition was taken in the matter of IPR2017-02148.
45. August 6, 2018. My deposition was taken in IPR2017-01799, IPR2017-01800, IPR2017-01801 and IPR2017-01802.

46. August 3, 2018. My deposition was taken in IPR2017-01797 and IPR2017-01798.
47. July 25, 26, and 27 2018 I testified at trial in the matter of Dale Oliver v Bruce Johanson Blair Johanson, and DB Squared LLC. Case No. 5:17-cv-05129-TLB.
48. July 19, 2018. My deposition was taken in the matter of Uniloc USA, Inc. vs Apple Inc., Case No.: 3:18-cv-00365-WHA.
49. June 28, 2018. My deposition was taken in Google LLC v Uniloc regarding the following IPR2017-01683, IPR2017-01684, IPR2017-01685. Google LLC v Uniloc IPR 2017-02080, and IPR 2017-02081.
50. March 02, 2018. My deposition was taken in the matter of Dale Oliver v Bruce Johanson, Blair Johanson, and DB Squared LLC.
51. December 22, 2017, I testified at a hearing in the matter of John M. Money, LLC dba Auditors Recovery Service v. AmWins Specialty Auto, Inc. Cause No. DC-16-05483 101st Judicial District Court.
52. November 27, 2017. My deposition was taken in the case of: Case IPR2017-00221, U.S. Patent 7,535,890; Case IPR2017-00222, U.S. Patent 8,243,723; and Case IPR2017-00225, U.S. Patent 8,995,433.
53. July 13 and 14, 2017. I testified at trial regarding patent invalidity in the case of Evicam International, Inc. v. Enforcement Video, LLC, d/b/a WatchGuard Video.
54. June 27, 2017. My deposition was taken in the case of Thomas Sisoian v. IBM. United States District Court for the Western District of Texas Austin Division Case No. 1-14-CV-565-SS.
55. June 17, 2017. My deposition was taken in the case of Evicam International, Inc. v. Enforcement Video, LLC, d/b/a WatchGuard Video, on the issues of patent invalidity.
56. April 17 and 18, 2017. I testified at trial in the case of Walmart Stores Inc. v. Cuker Interactive LLC. July 12, 2016. Case No. 5:14-CV-5262.
57. December 12, 2016. I testified at a hearing regarding multiple motions in the case of Walmart Stores Inc. v. Cuker Interactive LLC. Case No. 5:14-CV-5262
58. July 12, 2016. My deposition was taken in the case of Walmart Stores Inc. v. Cuker Interactive LLC. Case No. 5:14-CV-5262
59. June 7, 2016. I testified in the trial of United States v Michael Thomas.
60. My deposition was taken in the case of Federal Trade Commission and State of Florida v Inbound Call Experts, LLC, et. al. Case No. 14-81395-CIV-Marra/Matthewman US District Court Southern District of Florida.
61. October 9, 2015. I testified in the trial of Suncoast Post-Tension LTD vs Peter Scoppa, et. al.
62. September 25, 2015, and September 28, 2015, I testified in the trial of United States of America vs. Anastasio N. Laoutaris.
63. August 27, 2015, my deposition was taken in the Suncoast Post-Tension LTD vs Peter Scoppa, et. al. case.
64. May 22, 2015, my deposition was taken in the Attorney General of Florida v ASAP Tech Help LLC case.

65. December 17, 2014, I testified at a non-jury trial/hearing in the Federal Trade Commission vs PC Cleaner Pro Inc. case.
66. November 24, 2014, I testified at a non-jury trial/hearing in the Federal Trade Commission vs Boost Software Inc. case.
67. On November 13, 2014, my deposition was taken in the Neomedia Inc. vs Dunkin Brands Inc. case relating to patent indefiniteness/invalidity issues.
68. July 9, 2014, my deposition was taken in the Geotag v AT&T case relating to validity issues.
69. June 11, 2014, my deposition was taken in the Geotag v AT&T case relating to infringement issues on.
70. May 15, 2014, my deposition was taken in the Geotag v. Starbucks et al. case relating to invalidity issues regarding the defendants Dominos and Darden.
71. May 14, 2014, my deposition was taken in the Geotag v. Starbucks et. al. case relating to infringement issues regarding the defendant Darden.
72. 24 January 2014, my deposition was taken in the Geotag v. Frontier Communications et al. case relating to infringement issues regarding the defendants Gander Mountain and Abercrombie and Fitch.
73. 23 January 2014, my deposition was taken in the Geotag v. Frontier Communications et al. case relating to infringement issues regarding the defendants Trane and Genesco.
74. 22 January 2014, my deposition was taken in the Geotag v. Frontier Communications et al. case relating to infringement issues regarding the defendants Cinemark, Spencer's Gifts, and Regis Corp.
75. 21 January 2014, my deposition was taken in the Geotag v. Frontier Communications et al. case relating to infringement issues regarding the defendants Walmart, Nike, and Advanced auto.
76. January 2014, my deposition was taken in the PiNet v. J.P. Morgan Chase case relating to invalidity.
77. My deposition was taken in the Geotag v. Frontier Communications et. al. case relating to infringement issues regarding the defendants in Judge Gilstrap's court in December 2013. This was multiple defendants.
78. My deposition was taken in the Microsoft v. Geotag case regarding Google in December 2013.
79. I testified at an evidentiary hearing in the matter of Macroniche Software Inc. v 4 Imaging Solutions LLC, et. al. Southern District of Texas Houston Division.
80. I testified at the trial of Market One v. Tekcenture case in the Dallas County Courts in February 2013.
81. My deposition was taken in the Geotag v. Frontier Communications case regarding the defendant Yellow Pages in September 2013.
82. My deposition was taken in the Market One v. Tekcenture case in December 2012.
83. My deposition was taken in 2011 in Eolas Tech. Inc. v. Adobe Systems, Inc., et al., Civil Action No. 6:09-cv-446 (E.D. Tex.) (On behalf of defendant, Citibank).

Academic Experience

1. I am currently an adjunct professor for Vanderbilt University in their Master of Computer Science program. Specifically, I am teaching CS 8395 – Special Topics: Introduction to Quantum Computing. I am also teaching a graduate course in Digital Forensics.
2. I am currently an adjunct lecturer for Georgetown University. I teach graduate courses in cybersecurity, cryptography, and systems engineering courses.
3. I developed a graduate digital forensics course for the University of Dallas. I also taught this course for the University as an adjunct professor from 2019 to 2022.
4. I have taught classes at community colleges, technical colleges, universities, and corporate environments since 1998. These classes include programming courses (C, Java, C++, Objective C, C#/.Net, and others), software engineering, computer networking, system security, and digital forensics courses.
5. During 2019 I was a Professor of Practice with Capitol Technology University teaching graduate courses (masters and doctoral) in computer science, cybersecurity, electrical engineering, and research methods as well as chairing several doctoral dissertation committees. I was also the director for the Quantum Computing and Cryptography Research Laboratory at Capitol Technology University. I have chaired the following students to successful defense of their doctoral dissertations:
    a. Dr. Kellep Charles, dissertation title "A quantitative approach using the experimental design to evaluate the effects automated vulnerability security scanners have on cent-os server system services."
    b. Dr. Natalie Marini-Wear, dissertation title "A qualitative case study: software security in devops"
    c. Dr. Tomas Pena, dissertation title "A deep learning approach to detecting covert channels in the domain name system."
6. I have worked on numerous scientific conference committees. The following is a sample:
    a. At the 2018 Annual IEEE 8th Annual Computing and Communication Conference at the University of Nevada in Las Vegas, I chaired a session on Artificial Intelligence, and another session on Computer Architecture and VLSI.
    b. At the 2019 Annual IEEE 9th Annual Computing and Communication Conference I was a keynote speaker presenting a talk on "The impact of complexity and emergent properties on engineering". I also chaired a session on "IOT, Robotics and Machine Vision" as well as a session on "Mobile and Wireless Communication, Network".
    c. On the technical committee for "Wireless & Sensor Networks & Cybersecurity; Mobile Computing and Security" IEEE IEMCON 2019 Conference.

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013

d. Technical Program Co-Chair for the 2019 International Symposium on Blockchain Computing and Applications

e. On the technical committee for "Wireless & Sensor Networks & Cybersecurity; Mobile Computing and Security" IEEE Ubiquitous Computing, Electronics & Mobile Communications Conference (UEMCON) 2019 Conference.

f. Technical program chair for International Conference on Cyber Security: Recent Threats and Trends (ICCSTT) 2019

g. Program committee member for 2020 The 1st Workshop on Verification & Validation of Quantum Applications.

h. General Chair for the 2020 Quantum Computing and Engineering Conference (CQEC).

i. Technical program committee member for the inaugural IEEE International Conference on Quantum Computing and Engineering (QCE) 2020.

7. I have presented research talks at University of Texas at Dallas, Texas A&M San Antonio, Seton Hall University, Southern Methodist University, Columbia ACM Chapter, Harvard Computer Society, and Princess Sumuya University in Amman Jordan.

8. I am currently or have been previously a reviewer for several scientific journals:

a. Editor in Chief for the *American Journal of Science and Engineering (2017 to 2020).*

b. Editorial board for the Journal of Artificial Intelligence in Medical Imaging

c. Reviewer for the *International Journal of Cyber Warfare and Terrorism (IJCWT)(2016 to 2020)*.

d. Reviewer for scientific papers submitted to *IEEE Security & Privacy* and the *IEEE Open Access Journal*.

e. Reviewer for the *International Journal of Network Security (IJNS)*

f. Reviewer for scientific papers submitted to the *Journal of Information Warfare*

g. Reviewer for scientific papers submitted to the I*nternational Journal of Network Security*.

Volunteer Experience

I volunteer teaching digital forensics for law enforcement agencies. I conduct training in digital forensics and related topics for law enforcement agencies in the United States as well as other nations around the world. This is to assist those agencies in fighting human trafficking and crimes against children.

Professional Experience

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 57 of 67

From: 2005
To: Present
Organization: Chuck Easttom Consulting
Title: Computer Scientist/Consultant

As an independent consultant, I have developed 2 electronic medical records software solutions, several small financial and web-based applications, microcontroller programming, and consulted with various companies on networking and security issues. My consulting work has included security audits, penetration tests, and forensic analysis. I have also done corporate training and college teaching in a wide range of topics including network administration, network security, web development (HTML, JavaScript, CSS, ASP, ASP.Net etc.), programming (C, C++, C#, Rust, Python, Perl, Java, VB, etc.) and database operations (MS SQL Server, MySQL, PostGres, Microsoft Access, Oracle, etc.).

I also developed the advanced cryptography course for the EC- Council. I developed training courses for various companies such as SkillSoft and SimpliLearn in topics such as NoSQL, MongoDB, VMWare cloud, Information Systems Auditing, CSSLP certification prep, Secure software engineering, CISA certification prep, and others.

I frequently consult with various companies on computer security, cryptography, forensics, machine learning/artificial intelligence, DevOps, blockchain, software engineering, and related issues.

I work extensively in software engineering. That includes teaching and consulting on DevOps, secure software engineering, software standards including, but not limited to: NIST SP 800-27 – Life Cycle; IEEE 830-1993;IEEE 29148:2011;IEEE 15288; IEEE 829-1998 IEEE Standard for Software Test Documentation; IEEE 1008-1987 (R1993) IEEE Standard for Software Unit Testing; IEEE 1012-1998 Standard for Software Verification and Validation; IEEE 1028-1997.

My consulting activities have included a variety of government agencies including U.S. and Foreign governments. Consulting topics have included software engineering, cybersecurity, digital forensics, AI/ML, and computer networking. My consulting clients have included:

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 58 of 67

- Visa: Working on cybersecurity onboarding for their acquired entities. Conducting training in zero trust security, cloud security, and related topics.
- EC Council - Creating and teaching cybersecurity courses. I have worked on the EC Council cryptography courses, secure software engineering courses, blockchain courses, and advanced forensics courses.
- Skillsoft - Creating a range of technology related training videos. This includes software engineering, database, and cybersecurity related courses.
- Collin County College - Teaching a range of computer science and security courses.
- Saudi Aramco - Teaching and consulting on cybersecurity issues
- Consulting with DoD on a variety of engineering and cybersecurity projects
- Brand Protect - training and consulting on Dark Web investigations.
- SimpliLearn - Creating cybersecurity courses.
- TSTC - Tshukudu Technology College (Netherlands) - Teaching a variety of cybersecurity and cryptography courses.
- Allegiant Investigations- performing digital forensics investigations.
- College of the Ozarks - Threat Intelligence Consulting

From: 2003
To: 2013
Organization: Collin College (Professional Development Department)
Title: Adjunct Instructor (Part Time)

I taught professional development courses to IT professionals in programming (C, Java, C++, and C#), web development (HTML, JavaScript, CSS, and .net), networking, and network security. I have also designed and taught computer security courses for the college. These courses include:

- CompTIA Security+ Certification Prep.
- CISSP Certification Prep
- Hacking & Penetration Testing
- Computer Forensics
- Network Administration

Note from 2013 to 2019 I was paid as an outside training provider

From: 2003
To: 2005
Organization: Great American Insurance Company- Professional Liability Division
Title: Systems Director

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013

Summary: In this position I oversaw all application development including complex insurance Windows applications, web development including extensive online systems, database administration with SQL Server, network administration on a Windows based network, and network security for a division of an insurance company. This role combined management with hands on work in all of these areas. I was first hired as Systems Manager, then after 12 months promoted to Systems Director. While in this role I oversaw and participated in the development of a web portal to allow customers to apply for insurance, renew policies, and check status. This includes software processes, such as Agile, and other methods.

I personally developed an extensive reporting application. I also oversaw and participated in a complete re-writing of the underwriting application used by our underwriters. Development was primarily using .Net with Microsoft SQL Server as a backend.

.

From: 2000
To: 2003
Organization: Remington College
Title: Department Chair for Computer Information Systems department
Summary: I was initially hired as an instructor but was later promoted to department chair. I taught a variety of computer science courses and managed the Computer Information Systems department. I taught courses in programming (software design, Java, C++, etc.), systems analysis, web development (HTML, JavaScript, Java Applets, and .Net), e-commerce, and information security.

From: 1999
To: 2000
Organization: Digital Speech Systems Inc.
Title: Senior Software Engineer
Summary: I began at digital speech as a software engineer and was later promoted to senior software engineer. My duties included developing voicemail and related software as well as mentoring new programmers. The programming work included work on voicemail server software, unified messaging software, and related applications. I worked extensively with C, Visual C++, SQL Server, and Visual Basic.

From: 1998
To: 1999

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013

Organization: Southeastern Oklahoma State University
Title: Director of Academic Computing
Summary: I began as the Director of Educational Technology for the School of Arts and Letters but then took over the management of the entire universities information systems when I was promoted to the Director of Academic Computing for Southeastern Oklahoma State University. In this position I managed all technical support for the campus as well as overseeing all network administration, network security, and web development.

From: 1996
To: 1998
Organization: Alegis Corporation Systems Group
Title: Software Engineer
Summary: I began as a programmer/analyst and was later promoted to Software Engineer. I worked developing Windows based financial and collections applications for

companies such as Boatman's Bank of St. Louis, Chrysler Financial, and Western Union. I worked extensively with C, C++, and Visual Basic (Versions 4.0 and 5.0). I also developed and oversaw the website or the company using HTML, JavaScript, and Cascading Style Sheets.

From: 1995
To: 1996
Organization: Boeing Aerospace Operations
Title: Contract Programmer/Analyst
Summary: I worked as part of a team developing a Windows application to manage the maintenance and engineering tasks for the NATO AWACS. I worked with C, C++ and Visual Basic (starting with version 3.0) as well as Microsoft SQL Server.

From: 1991
To: 1995
Organization: Worked various technical support and computer related jobs while attending college. From late 1993 to 1995 a great deal of time was spent developing websites with HTML (1.0), JavaScript (beginning with its release in late 1995). Among the websites I created were websites for: a computer store, two martial arts studios, a quarter horse ranch, and a university chess club. During that same time period I worked extensively with some of the early browsers such as Mosaic and Netscape (late 1994). Prior to 1992, in 1991 to 1993 I worked building and repairing PC's.

From: 1987
To: 1991

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 61 of 67

Organization: United States Army
HHC 5/21 Infantry Battalion
7th Light Infantry Division
Title: Highest rank E-4
Summary: Awards received – Army Service Ribbon, National defense medal, marksman badge with grenade component. Honorable discharge.

Continuing Professional Education

I am always interested in updating and expanding my education, and therefore participate in seminars, webinars, online courses, continuing education/professional development training, etc. In some cases, I retake introductory or intermediate courses as a refresher. Here is an exemplary list of such courses.

- Paul Deitel, Teaching Strategies for Visual C# 2008 from Pearson Publishing – 2010.
- Design and Analysis of Algorithms from Massachusetts Institute of Technology – 2012.
- Parallel Computing from Massachusetts Institute of Technology – 2013.
- Microsoft Technet - Windows 7 Feature Overview – 2011.
- Programming Methodology from Stanford University Center for Professional Development – 2012.
- Perl fundamentals from the Association of Computing Machinery 2012.
- Key Issues in Distributed Systems from Stanford University Center for Professional Development – 2013.
- Introduction to HTML5 and CSS3 from the Association of Computing Machinery – 2013.
- Software Program Control Flow Fundamentals from the Association of Computing Machinery – 2013.
- Harvard Extension School CS 50 Intensive Introduction to Computer Science. This was an intensive coverage of C, PHP, MySQL, Algorithms, and Data Structures. I took this course as a refresher – 2014.
- The Fundamentals of Conducting an Internal Investigation from Guidance Software (webinar) – 2015
- Carnegie Mellon University Software Engineering Institute - Trends and New Directions in Software Architecture (webinar)- 2015
- Analyzing Evidence from Mobile Devices, Including Hidden and Deleted Data. Oxygen Forensics (webinar) – 2015
- Technical Debt in Large Systems: Understanding the Cost of Software Complexity. Massachusetts Institute of Technology (webinar) – 2015
- Current Trends in Computer Security. Stanford University (webinar) – 2015
- Windows FE and Live Forensic Triage (webinar) Forensic Magazine. – 2015
- American College of Forensic Examiners course - Forensic Examination of CCTV Digital VTR Surveillance Recording Equipment. 2015
- American College of Forensic Examiners course - Developmental and

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 62 of 67

Motivational Factors of Transnational Terrorists. 2015
- American College of Forensic Examiners course - Psychological Profiles of Terrorists. 2015
- Oxygen Forensics Trainer Certification Course – 2015
- Access Data FTK Online training course – 2015
- American College of Forensic Examiners course - Digital Forensics in the 21st Century – 2016
- Specialized Forensic Photography and Diagramming – June 2017
- IEEE Course: Integrated Circuit Digital Design Methodology November 2017
- IEEE Course: Integrated Circuit Digital Design Methodology: Advanced Analysis and Simulation November 2017
- IEEE Course: 4G Broadband LTE December 2017
- IEEE Course Analyzing the Security of Bluetooth Low Energy. 2021
- IEEE Course BlueScan: Boosting Wi-Fi Scanning Efficiency Using Bluetooth Radio. 2021
- IEEE Continuing education course "Thermo-Mechanical and Mechanical Reliability of Electronics" 2021
- IEEE Course Bottleneck Analysis of Traffic Monitoring using Wireshark. 2021
- IEEE Continuing education course “Making and Qualifying Reliable Extreme Environment Electronics” 2022
- 2023 Private Investigator Continuing Education Course on DNA Evidence
- 2023 Private Investigator Continuing Education Course on Ethics
- 2023 Private Investigator Continuing Education Course on Suspicious Death and Bodily Injury Investigations.
- 2023 Private Investigator Continuing Education Course on Motor Vehicle and Bodily Injury Investigations.

References to my work

The following sections are provided as examples of the impact my work in computer science has had in the field.

Media References

My computer science expertise has been sought out by reporters including:

- CNN Money interviewed me regarding alleged unbreakable cryptography http://money.cnn.com/2011/09/02/technology/unhackable_code/
- CBS SmartPlanet interviewed me regarding NSA and cryptography http://www.smartplanet.com/blog/bulletin/nsa-proof-products-protective-or-a-profit-motive/
- "NSA proof products: protective or a profit motive?" also appeared on ZDNet.
- E-book’s directory lists my “Moving from Windows to Linux” book as one of the top 10 Linux books http://www.e-booksdirectory.com/linux/top10.html.
- Lawrence Journal World interviewed me for a hacking story that was published August 6, 2006. The article was entitled "Hacker’s infiltrate Web site".

- GoCertify.com Author Interview "Author Interview: CCFP Certified Cyber Forensics Professional All-in-One Exam Guide" January 2015
- ISMG interviewed me regarding the JP Morgan Chase Breach of 2015 http://www.bankinfosecurity.com/interviews/what-jpmorgan-chase-breach-teaches-us-i-2982
- CIO Magazine (Nov 14, 2016) in the article "12 steps to lower your espionage risk" references my book Computer Security Fundamentals 3rd Edition.
- Forensic Focus Magazine (June 2017) interviewed me regarding my work in applying graph theory to digital forensics.
- Sputnik Press Interviewed (June 2021) me regarding the Biden-Putin cybersecurity talks. https://sputniknews.com/analysis/202106161083169993-putin-biden-cybersecurity-talk-may-mark-end-of-wild-west-era-in-cyberspace-expert-says/
- Bank Info Security interviewed me (2015) regarding the JP Morgan Breach https://www.bankinfosecurity.com/interviews/lessons-from-chase-breach-i-2982.
- Lara Logan has no Agenda "Privacy in the Digital Age" July 2021.
- Vice The Motherboard Guide to Steganography interviewed me regarding steganography https://www.vice.com/en/article/m7e9n3/the-motherboard-guide-to-steganography

References to publications

My books and articles have been referenced by numerous computer scientists, including being referenced in several Ph.D. dissertations and master's Thesis'. My books are used as textbooks at over 60 universities around the world.

Training

Since the late 1990's I have been teaching at least on a part-time basis. I have taught courses at colleges, technical schools, corporate training environments, and on site for companies and government agencies. Some of my training courses are through my own training company CEC-LLC, which is approved by the U.S. Department of Homeland Security National Initiative for Cyber Security Careers and Studies (NICCS) https://niccs.us-cert.gov/training/search/cec-security-llc
I have taught courses in the following topics:

1. HTML (including HTML 5 and CSS3)
2. JavaScript (including advanced courses)
3. Java
4. C and C++
5. VB.Net, ASP.Net, and C#
6. Objective C/iPhone programming
7. Microsoft SQL Server
8. Oracle
9. DevOps

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013

10. Containers (Docker and Kubernetes)
11. Microsoft Access
12. NoSQL (including MongoDB and CouchDB)
13. Computer Networks (routers, switches, virtualization, SDN, NFV, etc.)
14. Computer Hardware (motherboards, chips, etc.)
15. JTAG techniques for phone forensics
16. Certification preparation courses for the following certifications: CompTIA A+, CompTIA Network+, CompTIA Security+, CISSP, ISSAP, CEH, CISA, CSSLP, ECES, CND, and CHFI.
17. Computer forensics (phone forensics, Windows forensics, general forensic science, etc.)
18. Computer security (principles, IDS/IPS, Honey Pots, policies, DRP/BCP, cyber threat intelligence, etc.)
19. Cryptology (including advanced courses)
20. Math for cryptography including statistics, number theory, combinatorics, abstract algebra, graph theory, and related topics.
21. Windows Server (NT 4.0, Server 2003, Server 2008, Server 2012)
22. Secure programming (including web programming)
23. Linux
24. Hacking and penetration testing
25. Cloud Computing

I have conducted computer security (computer forensics, network security, penetration testing cryptography, etc.) related courses for a variety of government and law enforcement agencies, various law enforcement officers, friendly foreign governments, and a variety of corporations.

I have also created a number of video courses for companies such as Skillsoft on topics such as Secure Programming, MongoDB, NoSQL, DevOps, Virtualization, Cloud computing, Digital Forensics, and other topics.

Technical Skills

The Following is an exemplary list of technologies. This is not meant to be an exhaustive list, but rather to provide a sample of areas within which I have expertise. I have experience and/or knowledge with:
Computer Hardware: CPU architecture, motherboard structure, chip programming/testing (using HDLs, System Verilog, etc.) and testing, etc.
Quantum Computing: Quantum concepts, quantum physics, quantum programming (QASM, Q#, Qiskit, etc.), quantum hardware (ion trap, Bose Einstein condensate, nitrogen vacancy, photon based, etc.).
Alternate Computer Systems: Neuromorphic computing, molecular computing, etc.
Programming Languages: C, C++, Assembly, .Net (C#, VB.Net, etc.), Go, Swift, Rust, Pascal, Python, PHP, Ruby, Perl, Rust, Objective C, Java, Kotlin, and SmallTalk. This list is exemplary and not exhaustive.
Software Engineering: Design and testing methodologies. ISO 9000, ISO 15504, also

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013
Page 65 of 67

known as Software Process Improvement Capability Determination (SPICE), UML, software complexity measurements, etc.
Web development technologies: HTML, JavaScript, PHP, CSS, ColdFusion, Flash, and Dream Weaver.
Engineering Methods: Systems architecture, systems modeling, engineering processes, requirements engineering, reliability engineering, circuit design, chip design, and related topics.
Artificial Intelligence: Expert systems, Fuzzy Logic, and AI Programming. Machine learning includes TensorFlow, Python, and similar tools.
Blockchain: Bitcoin, ethereum, decentralized apps (DApps), Decentralized Autonomous Organization (DAO), and related topics.
Internet of Things(IoT): IoT operating systems, protocols, and networking.
Software: Expertise with medical software including Electronic Medical Records, financial software, Business Process Management software (BPM), as well as other types of software.
Business Intelligence: Business intelligence methods, trade secret protection, and related topics.
Cryptography: I have extensive knowledge of cryptographic algorithms such as: DES, Blowfish, Twofish, AES, Serpent, RSA, Diffie-Hellman, ElGamal, MQV, ECC, GOST, KRYSTALS-KYBER, NTRU, Lattice Based Cryptography, and others. Also, Cryptographic hashes, message authentication codes, and cryptographic protocols.
Mathematics: Discrete math, number theory, graph theory, linear algebra, statistics, and algorithm analysis, etc..
Compression Algorithms: Lempel-Zev, Lempel-Ziv-Welch, Burrows Wheeler, Adaptive Transform Acoustic Coding (ATRAC), Huffman coding , Cartesian Perceptual Compression, etc.
Cell Phones: I am experienced with iOS and Android. I have worked with both operating systems extensively, including teaching programming for both operating systems and reviewing source code for both operating systems. I am also familiar with the hardware for both devices, including details regarding integrated circuits in both devices.
Networking: Network protocols, routers, switches, servers, IPv4, IPv6, Network models and concepts (TCP/IP, OSI, etc.), telecommunications, and network management. Networking protocols including ANT+, Bluetooth, Zigbee, 6LowPAN, etc. Also, I am very familiar with cloud computing with both theoretical knowledge and hands on experience with VMWare cloud, Azure, and AWS.
Databases: MySQL, SQL Server, DB2, PostGres, Progress, Microsoft SQL Server, MS Access, Oracle, and SQL Anywhere. I have also worked with NoSQL databases including MongoDB and CouchDB.
Computer/Network Security: PCI standards, Common Criteria, penetration testing, computer viruses and other malware, disaster recovery planning, cryptology, firewalls, IDS, Honey Pots, biometrics, chip security, cyber threat intelligence, cyber threat intelligence, competitive business intelligence, and security policies & procedures.
Cyber Forensics: PC forensics, network forensics, cell phone forensics (including JTAG). I have experience with a wide range of tools, including but not limited to: Guidance Software Encase, Access Data FTK, Cellebrite, Paraben Sim Seizure, Oxygen Forensics, OSForensics, WindowsFE, and various open-source tools.

Domains: The domains within which I have practical IT experience include finance & banking, insurance, education, customer management, geographical mapping/tracking, defense department applications, and medical applications (including electronic medical records and medical billing).
Soft Skills: I have experience in valuing software and intellectual property as well as IT management related issues.

CARDWARE EXHIBIT 2007
SAMSUNG V. CARDWARE
PGR2023-00013