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Education

- Carnegie Mellon University, Pittsburgh, Pennsylvania
  Doctor of Philosophy in Electrical and Computer Engineering, August 1992.
  GPA: 4.0 / 4.0.

  Thesis: "Controlled Active Vision" under the supervision of Professor Pradeep K. Khosla.

- Carnegie Mellon University, Pittsburgh, Pennsylvania
  Master of Science in Electrical and Computer Engineering, December 1988.
  GPA: 4.0 / 4.0.

  Project: "FORS: Flexible Organizations" under the supervision of Professor Sarosh Talukdar.

- National Technical University of Athens, Athens, Greece
  Diploma of Engineering in Electrical and Computer Engineering, July 1987.
  GPA: 8.75 / 10.0.

  Project: "Use of Fuzzy Logic in the Selection of Gains of the PID Controller" under the supervision of Professor Spyros Tzafestas.

Professional Experience

- Director Minnesota Robotics Institute: University of Minnesota, Minneapolis, Minnesota.
  July 2019 - present.

- Professor: University of Minnesota, Minneapolis, Minnesota.
  Fall 2001 - present.

- Associate Professor: University of Minnesota, Minneapolis, Minnesota.
  Fall 1996 - 2001.

- Assistant Professor: University of Minnesota, Minneapolis, Minnesota.
  Fall 1992 - 1996.

Research Experience

- University of Minnesota, September 1992 - Present

  Computer Vision and Sensing
  Object Recognition
  Intelligent Transportation Systems
  Robotics
  Machine Learning
  Medical Robotics
  Sensor Networks
  Robotic Visual Tracking and Servoing
  Sensor-Based Control in Transportation Systems
  Active Vision
  Computer Engineering
  Signature Recognition and Identification
  Computer Engineering

- Carnegie Mellon University, August 1987 - August 1992

  Robotics, Computer Vision, and Control
  Computer Integrated Manufacturing
  Tool Integration
  Software Engineering

- National Technical University of Athens, September 1986 - July 1987

  Fuzzy and Intelligent Control

Industrial Experience

- Consultant: University of Cyprus, Nicosia Cyprus.
  Helped in the creation of the Department of Electrical and Computer Engineering, 2001 - 2005.

- Consultant: Banner Engineering, Carnegie Robotics, Sentera, KYOS, Tennant, ISS, Best Buy, Moai Technologies, MOVE eye, VideoNEXT Inc., DATACARD Inc., etc., Minneapolis, MN.
  Developed computer vision algorithms for vehicle tracking, camera calibration, precision agriculture, human tracking, object recognition, and fingerprint recognition, 1997 - Present.

- Consultant: IMS ExpertServices, ABB, Toyota, Canon, Intel, Tetra Tech, iRobot, Kenyon and Kenyon, Orrick, Perkins Coie LLP, Fish & Richardson, Finnegan, Henderson, Farabow, Garrett & Dunner LLP, Oblon, McClelland, Maier & Neustadt, LLP, Phillips Nizer LLP, Andrews Kurth Kenyon LLP, and Bartlit Beck Herman Palenchar & Scott LLP, Minneapolis, MN.
  Provided technical expertise in litigation that involves surveillance systems, robotics, computer vision, vehicle monitoring systems, human activity monitoring, and motion control devices, 2012 - Present.

- Consultant: Architecture Technology Corporation, Eden Prairie, MN.
  Developed algorithms and software for multi-robot teams, 2003 - 2005.

- Founder: ReconRobotics Inc., Edina, MN.
  Developed different robotic platforms, 2005-Present.

- Software Engineer: Piraeus Service Bureau, Piraeus, Greece.
  Developed software for inventory control, accounting, and factory automation. August 1983 - July 1987.

Teaching Experience

- Professor: University of Minnesota,
  Minneapolis, Minnesota.
  Taught several undergraduate and graduate courses, Fall 2001 - Present.

- Director of Undergraduate Studies: University of Minnesota,
  Minneapolis, Minnesota.
  Supervised the CSE Undergraduate Program, Fall 2001 – Spring 2004.

- Associate Professor: University of Minnesota, Minneapolis, Minnesota.
  Taught several undergraduate and graduate courses, Fall 1996 - 2001.

- Assistant Professor: University of Minnesota, Minneapolis, Minnesota.
  Taught several undergraduate and graduate courses, Fall 1992 - 1996.

- Teaching Assistant: Carnegie Mellon University, Pittsburgh, Pennsylvania.
  Assisted in the teaching of the graduate course “Robotic Systems”, Spring 1989.

Publications

Journal Papers (Significant papers are in bold)

1. Schwartzwald, A., Tlachac, M., Guzman, L., Bacharis, T., and Papanikolopoulos, N.P., “Tumbling Robot Control Using Reinforcement Learning: An Adaptive Control Policy That Transfers Well to the Real World," in *IEEE Robotics & Automation Magazine*, 2023.

2. **Guzman, L., Morellas, V., and Papanikolopoulos, N.P., "Robotic Embodiment of Human-Like Motor Skills via Reinforcement Learning", *IEEE Robotics and Automation Letters*, Volume 7, No. 2, April 2022, pp 3711-3717. The paper was also presented at the 2022 IEEE Int. Conference on Robotics and Automation.**

3. Henderson, T., Favour, R., Hamlen, B., Mitha, I., Bowe, E., and Papanikolopoulos, N.P., "Hovering Locomotion for UAVs with Thrust-Vectoring Control Surfaces", *IEEE Robotics and Automation Letters*, Volume 7, No. 2, April 2022, pp 5214-5221. The paper was also presented at the 2022 IEEE Int. Conference on Robotics and Automation.

4. Cherian, A., Stanitsas, P., Wang, J., Harandi, M., Morellas, V., and Papanikolopoulos, N.P., “Learning Log-Determinant Divergences for Positive Definite Matrices”, *IEEE Trans. on Pattern Analysis and Machine Intelligence,* Volume 44, No. 9, 2022, pp 5088-5102.

5. Mallery, K., Canelon, D., Hong, J., and Papanikolopoulos, N.P., “Design and Experiments with a Robot-Driven Underwater Holographic Microscope for Low-Cost In Situ Particle Measurements”, *Journal of Intelligent and Robotic Systems*, Volume 102, No. 2, 2021.

6. Rickman, J., Struyk, G., Simpson, B., Byun, B., and Papanikolopoulos, N., "The Growing Role for Semantic Segmentation in Urology". *European Urology Focus*, Volume 7, No. 4, 2021, pp 692-695.

7. Martin, R., Leppink-Shands, P., Tlachac, M., DuBois, M., Conelea, C., Jacob, S., Morellas, V., Morris, T., and Papanikolopoulos, N.P., "The Use of Immersive Environments for the Early Detection and Treatment of Neuropsychiatric Disorders", *Frontiers in Digital Health, Section Connected Health*, Volume 2, February 2021.

8. **Heller, N., Isensee, F., Maier-Hein, K., Houd, X., Xied, C., Lid, F., Nand, Y., Mue, G., Ling, Z., Hane, M., Yaoe, G., Gaoe, Y., Zhangh, Y., Wangh, Y., Houh, F., Yang, J., Xiong, G., Tiank, J., Zhongk, C., Mal, J., Rickmana, J., Deana, J., Stai, B., Tejpaul, R., Oestreicha, M., Blake, P., Kaluzniako, H., Razao, S., Rosenberg, J., Moore, K., Walczaka, E., Rengel, Z., Edgerton, Z., Vasdev, R., Peterson, M., McSweeney, S., Peterson, P., Kalapara, A., Sathianathen, N., Papanikolopoulos, N., and Weight, C.J., "The State of the Art in Kidney and Kidney Tumor Segmentation in Contrast-enhanced CT Imaging: Results of the KiTS19 Challenge", *Medical Image Analysis*, January 2021.**

9. Stanitsas, P., Cherian, A., Morellas, V., Tejpaul, R., Papanikolopoulos, N.P., and Truskinovsky, A., "Image Descriptors for Weakly Annotated Histopathological Breast Cancer Data", *Frontiers in Digital Health, Section Connected Health*, December 2020.

10. Zermas, D., Nelson, H., Stanitsas, P., Morellas, V., Mulla, D., and Papanikolopoulos, N.P., "A Methodology for the Detection of Nitrogen Deficiency in Corn Fields Using High-Resolution RGB Imagery*", IEEE Transactions on Automation Science and Engineering*, October 2020.

11. Stai, B., Heller, N., McSweeney, S., Rickman, J., Blake, P., Vasdev, R., Edgerton, Z., Tejpaul, R., Peterson, M., Rosenburg, J., Kalapara, A., Regmi, S., Papanikolopoulos, N., and Weight, C., "Public Perceptions of Artificial Intelligence and Robotics in Medicine", Journal of Endourology, Volume 34, No. 10, October 2020.

12. **Zermas, D., Morellas, V., Mulla, D., and Papanikolopoulos, N.P., "3D Model Processing for High Throughput Phenotype Extraction – the Case of Corn", *Computers and Electronics in Agriculture*, Volume 172, May 2020.**

13. Beksi, W., and Papanikolopoulos, N.P., "A Topology-based Descriptor for 3D Point Cloud Modeling: Theory and Experiments", *Image and Vision Computing*, Volume 88, August 2019, pp 84-95.

14. Walczak, N., Fasching, J., Cullen, K., Morellas, V., and Papanikolopoulos, N.P., "Toward Identifying Behavioral Risk Markers for Mental Health Disorders: An Assistive System for Monitoring Children's Movements in a Preschool Classroom", *Machine Vision and Applications*, Volume 29, No. 4, May 2018, pp 703-717.

15. Bernstein, G., Hadjiyanni, T., Cullen, K., Robinson, J., Harris, E., Young, A., Fasching, J., Walczak, N., Lee, S., Morellas, V., and Papanikolopoulos, N.P., "Use of Computer Vision Tools to Identify Behavioral Markers of Pediatric Obsessive-Compulsive Disorder: A Pilot Study", Journal of Child and Adolescent Psychopharmacology, Volume 27, No. 2, March 2017, pp 140-147.

16. Zhang, D., Zhao, J., Zhang, F., Jiang, R., He, T., and Papanikolopoulos, N.P., "Last-Mile Transit Service with Urban Infrastructure Data", *ACM Trans. on Cyber-Physical Systems*, Volume 1, No. 2, February 2017.

17. **Cherian, A., Morellas, V., and Papanikolopoulos, N.P., "Bayesian Nonparametric Clustering of Positive Definite Tensors", *IEEE Trans. on Pattern Analysis and Machine Intelligence*, Volume 38, No. 5, May 2016, pp 862-874.**

18. Fehr, D., Beksi, W., Zermas, D., and Papanikolopoulos, N.P., "Covariance Based Point Cloud Descriptors for Object Detection and Recognition", Computer Vision and Image Understanding, Volume 142, January 2016, pp 80-93.

19. Sivalingam, R., Boley, D., Morellas, V., and Papanikolopoulos, N.P., "Tensor Dictionary Learning for Positive Definite Matrices", *IEEE Trans. on Image Processing*, Volume 24, No. 11, November 2015, pp 4592-4601.

20. Andersh, J., Cherian, A., Mettler, B., and Papanikolopoulos, N.P., "A Vision Based Ensemble Approach to Velocity Estimation for Miniature Rotorcraft", *Autonomous Robots*, Volume 39, No. 2, August 2015, pp 123-138.

21. **Cherian, A., Sra, S., Morellas, V., and Papanikolopoulos, N.P., "Efficient Nearest Neighbors via Robust Sparse Hashing", *IEEE Trans. on Image Processing,* Volume 23, No. 8, August 2014, pp 3646-3655.**

22. Somasundaram, G., Cherian, A., Morellas, V., and Papanikolopoulos, N.P., "Action Recognition Using Global Spatio-Temporal Features Derived from Sparse Representations", Volume 123, *Computer Vision and Image Understanding*, June 2014, pp 1-13.

23. **Hashemi, J., Tepper, M., Spina, T., Esler, A., Morellas, V., Papanikolopoulos, N.P., Egger, H., Dawson, G., and Sapiro, G., "Computer Vision Tools for the Non-invasive Assessment of Autism-related Behavioral Markers", *Autism Research and Treatment*, June 2014.**

24. Sivalingam, R., Boley, D., Morellas, V., and Papanikolopoulos, N.P., "Tensor Sparse Coding for Positive Definite Matrices", *IEEE Trans. on Pattern Analysis and Machine Intelligence,* Volume 36, No. 3, March 2014, pp 592-605.

25. Drenner, A., Janssen, M., Kottas, A., Kossett, A., Carlson, C., Lloyd, R., and Papanikolopoulos, N.P., "Multi-robot Teams with Miniature Robots and Mobile Docking Stations", *Journal of Intelligent and Robotic Systems,* Volume 72, No. 2, November 2013, pp 263-284.

26. **Cherian, A., Sra, S., Banerjee, A., and Papanikolopoulos, N.P., "Jensen-Bregman LogDet Divergence with Application to Efficient Similarity Search for Covariance Matrices", *IEEE Trans. on Pattern Analysis and Machine Intelligence,* Volume 35, No. 9, September 2013, pp 2161-2174.**

27. Somasundaram, G., Sivalingam, R., Morellas, V., and Papanikolopoulos, N.P., "Classification and Counting of Composite Objects in Traffic Scenes Using Global and Local Image Analysis", *IEEE Trans. on Intelligent Transportation Systems,* Volume 14, No. 1, March 2013, pp 69-81.

28. **Joshi, A., Porikli, F., and Papanikolopoulos, N.P., "Scalable Active Learning for Multi-Class Image Classification", *IEEE Trans. on Pattern Analysis and Machine Intelligence,* Volume 34, No. 11, November 2012, pp 2259-2273.**

29. **Ribnick, E., Sivalingam, R., Papanikolopoulos, N.P., and Daniilidis, K., "Reconstructing and Analysing Periodic Human Motion from Stationary Monocular Views", *Computer Vision and Image Understanding,* Volume 116, No. 7, July 2012, pp 815-826.**

30. Min, H., and Papanikolopoulos, N.P., "Robot Formations Using a Single Camera and Entropy-Based Segmentation", *Journal of Intelligent and Robotic Systems,* Volume 68, No. 1, March 2012, pp 21-41.

31. Bird, N., and Papanikolopoulos, N.P., "Optimal Image-Based Euclidean Calibration of Structured Light Systems in General Scenes", *IEEE Trans. on Automation Science and Engineering,* Volume 8, No. 4, October 2011, pp *815-823*.

32. Sharma, M., Dos Santos, T., Papanikolopoulos, N.P., and Hui, S.K., "Feasibility of Intra-fraction Whole Body Motion Tracking for Total Marrow Irradiation", *Journal of Biomedical Optics,* Volume 16, No. 5*,* May 2011.

33. Ribnick, E., and Papanikolopoulos, N.P., "3D Reconstruction of Periodic Motion from a Single View", *International Journal of Computer Vision,* Volume 90, No. 1, October 2010, pp 28-44*.*

34. Atev, S., Miller, G., and Papanikolopoulos, N.P., "Clustering of Vehicle Trajectories", *IEEE Trans. on Intelligent Transportation Systems,* Volume 11, No. 3*,* September 2010, pp 647-657*.*

35. Veeraraghavan, H., and Papanikolopoulos, N.P., "Learning to Recognize Video-based Spatio-temporal Events", *IEEE Trans. on Intelligent Transportation Systems,* Volume 10, No. 4, December 2009, pp 628-638.

36. Cao, D., Masoud, O., Boley, D., and Papanikolopoulos, N.P., "Online Motion Classification Using Support Vector Machines", *Computer Vision and Image Understanding,* Volume 113, No. 10, October 2009, pp 1064-1075.

37. Bodor, R., Jackson, B., Masoud, O., Fehr, D., and Papanikolopoulos, N.P., "View-Independent Motion Classification Using Image-Based Reconstruction", *Image and Vision Computing,* Volume 27, No. 8, July 2009, pp 1194-1206.

38. Ribnick, E., Atev, S., and Papanikolopoulos, N.P., "Estimating 3D Positions and Velocities of Projectiles from Monocular Views", *IEEE Trans. on Pattern Analysis and Machine Intelligence,* Volume 31, No. 5, May 2009, pp 938-944.

39. Anderson, M., and Papanikolopoulos, N.P., "Implicit Cooperation Strategies for Multi-robot Search of Unknown Areas", *Journal of Intelligent and Robotic Systems*, Volume 53, No. 4, December 2008, pp 381-397.

40. Joshi, A., and Papanikolopoulos, N.P., "Learning to Detect Moving Shadows in Dynamic Environments", *IEEE Trans. on Pattern Analysis and Machine Intelligence,* Volume 30, No. 11, November 2008, pp 2055-2063.

41. Fiore, L., Fehr, D., Bodor, R., Drenner, A., Somasundaram, G., and Papanikolopoulos, N.P., "Multi-Camera Human Activity Monitoring", *Journal of Intelligent and Robotic Systems,* Volume 52, No. 1, May 2008, pp 5-43.

42.* Kilambi, P., Joshi, A., Ribnick, E., Masoud, O., and Papanikolopoulos, N.P., "Estimating Pedestrian Counts in Groups", *Computer Vision and Image Understanding,* Volume 110, No. 1, April 2008, pp 43-59*.

43. Rybski, P., Roumeliotis, S., Gini, M., and Papanikolopoulos, N.P., "Appearance-Based Mapping Using Minimalistic Sensor Models", *Autonomous Robots,* Volume 24, No. 3, April 2008, pp. 213-227.

44. Papanikolopoulos, N.P., "EvalWare: Signal Processing for Robotics", *IEEE Signal Processing Magazine,* Volume 25, No. 1, 2008, pp 154-157.

45. Masoud, O., and Papanikolopoulos, N.P., "Using Geometric Primitives to Calibrate Traffic Scenes", *Transportation Research Part C: Emerging Technologies,* Volume 15, No. 6, December 2007, pp 361-379.

46. Bodor, R., Drenner, A., Schrater, P., and Papanikolopoulos, N.P., "Optimal Camera Placement for Automated Surveillance Tasks", *Journal of Intelligent and Robotic Systems,* Volume 50, No. 3, November 2007, pp 257-295.

47. Cannon, K., LaPoint-Anderson, M., Bird, N., Panciera, K., Veeraraghavan, H., Papanikolopoulos, N., and Gini, M., "Using Robots to Raise Interest in Technology Among Underrepresented Groups", *IEEE Robotics and Automation Magazine*, Volume 14, No. 2, June 2007, pp 73-81.

***48.* Veeraraghavan, H., Bird, N., Atev, S., and Papanikolopoulos, N.P., "Classifiers for Driver Activity Monitoring", *Transportation Research Part C: Emerging Technologies,* Volume 15, No. 1, February 2007, pp 51-67.**

49. Veeraraghavan, H., Schrater, P., and Papanikolopoulos, N.P., "Robust Target Detection and Tracking Through Integration of Color, Motion, and Geometry", *Computer Vision and Image Understanding,* Volume 103, No. 2, August 2006, pp 121-138.

50. Pearce, J., Powers, B., Hess, C., Rybski, P., Stoeter, S., and Papanikolopoulos, N.P., "Using Virtual Pheromones and Cameras for Dispersing a Team of Multiple Miniature Robots", *Journal of Intelligent and Robotic Systems,* Volume 45, No. 4, April 2006, pp 307-321.

51. Stoeter, S., and Papanikolopoulos, N.P., "Kinematic Motion Model for Jumping Scout Robots", *IEEE Trans. on Robotics,* Volume *22,* No. 2, April 2006, pp 398-403.

52. Atev, S., Arumugam, H., Masoud, O., Janardan, R., and Papanikolopoulos, N.P., "A Vision-Based Approach to Collision Prediction at Traffic Intersections", *IEEE Trans. on Intelligent Transportation Systems,* Volume 6, No. 4, December 2005, pp 416-423.

53. Jackson, B., Bodor, R., and Papanikolopoulos, N.P., "Deriving Occlusions in Static Scenes from Observations of Interactions with a Moving Figure", *Advanced Robotics,* Volume 19, No 10, 2005, pp 1043-1058.

54. Bird, N., Masoud, O., Papanikolopoulos, N.P., and Isaacs, A., "Detection of Loitering Individuals in Public Transportation Areas", *IEEE Trans. on Intelligent Transportation Systems,* Volume 6, No. 2, June 2005, pp 167-177.

55. Stoeter, S., and Papanikolopoulos, N.P., "Autonomous Stair-Climbing with Miniature Jumping Robots", *IEEE Trans. on Systems, Man, and Cybernetics: Part B,* Volume 35, No. 2, April 2005, pp 313-325.

56. Maurin, B., Masoud, O., and Papanikolopoulos, N.P., "Tracking All Traffic: Computer Vision Algorithms for Monitoring Vehicles, Individuals, and Crowds", *Robotics and Automation Magazine,* Volume 12, No. 1, March 2005, pp 29-36.

57. Dos Santos, C., Stoeter, S., Rybski, P., and Papanikolopoulos, N.P., "Panoramic Imaging for Miniature Robots", *Robotics and Automation Magazine,* Volume 11, No. 4, December 2004, pp 62-68.

***58.* Perrin, D., Kadioglu, E., Stoeter, S., and Papanikolopoulos, N.P., "Grasping and Tracking Using Constant Curvature Dynamic Contours", *International Journal of Robotics Research,* Volume 22, No. 10-11, October 2003, pp 855-871.**

59. McMillen, C., Stubbs, K., Rybski, P., Stoeter, S., Gini, M., and Papanikolopoulos, N.P., "Resource Scheduling and Load Balancing in Distributed Robotic Control Systems", *Robotics and Autonomous Systems,* Volume 44, No. 3-4, September 2003, pp 251-259.

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61. **Masoud, O., and Papanikolopoulos, N.P., "A Method for Human Action Recognition", *Image and Vision Computing,* Volume 21, No. 8, 2003, pp 729-743.**

62. Rybski, P., Stoeter, S., Papanikolopoulos, N.P., Burt, I., Dahlin, T., Gini, M., Hougen, D., Krantz, D., and Nageotte, F., "Sharing Control: a Framework for the Operation and Coordination of Multiple Miniature Robots", *IEEE Robotics and Automation Magazine*, Volume 9, No. 4, 2002, pp 41-48.

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64. Rybski, P., Stoeter, S., Gini, M., Hougen, D., and Papanikolopoulos, N.P., "Performance of a Distributed Robotic System Using Shared Communications Channels: A Framework for the Operation and Coordination of Multiple Miniature Robots", *IEEE Transactions on Robotics and Automation,* Volume 18, No. 5, October 2002, pp 713-727. It also appeared in “Advances in plan-based control of robotic agents,” Lecture Notes in Artificial Intelligence, Volume 2466, 2002, pp. 211-225.

65. Stoeter, S., Rybski, P., McMillen, C., Stubbs, K., Gini, M., Hougen, D., and Papanikolopoulos, N.**,** "A Robot Team for Surveillance Tasks: Design and Architecture", *Robotics and Autonomous Systems,* Volume 40, No. 2-3, August 2002, pp 173-183.

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297. Papanikolopoulos, N. P., and Khosla, P. K., "Real-Time LQG Robotic Visual Tracking", *Proceedings of the European Robotics and Intelligent Systems Conference*, pp 305-312, Corfu, Greece, June 23 - 28, 1991.

298. Papanikolopoulos, N. P., Khosla, P. K., and Kanade, T., "Adaptive Robotic Visual Tracking", *Proceedings of the American Control Conference,* pp 962 - 967, Boston, June 26 - 28, 1991.

299. Papanikolopoulos, N. P., Khosla, P. K., and Kanade, T., "Vision and Control Techniques for Robotic Visual Tracking", *Proceedings of the 1996 IEEE Int. Conference on Robotics and Automation*, pp 857 - 864, Sacramento, April 7 - 13, 1991. Finalist for the Anton Philips Award for Best Student Paper.

300. Papanikolopoulos, N. P., "FORS: A System for Flexible Design", *Proceedings of the IEEE Systems, Man and Cybernetics Conference*, pp 724 - 726, Los Angeles, November 4 - 7, 1990.

301. Papanikolopoulos, N. P., "FORS: A Flexible Design Environment", *Proceedings of the HICSS-23, IEEE Hawaii International Conference on System Sciences*, pp 463 - 470, Hawaii, January 2 - 5, 1990.

302. Papanikolopoulos, N. P., "A Graph Based Design Environment", *Proceedings of the IEEE Second International Conference on Computer Integrated Manufacturing*, pp 124 - 130, Rensselaer Polytechnic Institute, Troy, May 21 -23, 1990.

303. Stoa, P., Talukdar, S. N., Christie, R. D., Hou, L., Papanikolopoulos, N. P., "Environments for Security Assessment and Enhancement", *Proceedings of the Second Symposium on Expert Systems Applications to Power Systems*, pp 183-188, University of Washington, Seattle, July 17 - 20, 1989.

304. Talukdar, S., Elfes, A., and Papanikolopoulos, N. P., "Concurrent Design, Simultaneous Engineering and Distributed Problem Solving", *presented in the AAAI Seventh National Conference on Artificial Intelligence / AI in Design Workshop*, Minneapolis, August, 1988. Also available as an EDRC Technical Report, May 1988.

305. Tzafestas, S., and Papanikolopoulos, N. P., "Intelligent PID Control Based on Fuzzy Logic", *Proceedings of IFAC / IMACS International Symposium on Distributed Intelligence Systems,* Varna, Bulgaria, June 27 - July 1, 1988.

Selected Recent Grants

- "Kidney Cancer Radiomics Data Collection and Processing", Johnson & Johnson, December 19, 2022 – April 30, 2024.
- "NRI: INT: COLLAB: Cooperative Robotic Systems for Precision Agriculture and Plant Health Management" (with Co-PIs D. Mulla, D. Kaiser, and C. Yang), USDA-NIFA, May 1, 2020 – April 30, 2023.
- "Phase II IUCRC University of Minnesota: Center for Robots and Sensors for the Human Well-being" (Co-PI, PI: V. Morellas), NSF, March 15, 2020 – February 28, 2025.
- "MRI: Development of Real-time 3D Social Signal Imaging System (SSIS)" (Co-PI, PI: H.S. Park), NSF, October 1, 2019 – September 30, 2022.
- "Using Non-Expert Crowds to Quickly and Efficiently Collect High-Quality Segmentations of Renal Anatomy and Tumors in Cross-Sectional Imaging", Intuitive Foundation, January 1, 2021 – December 31, 2021.

- “MRI: Development of an Instrument that Performs Behavioral Analysis for Neuropsychiatric Disorders like Tourette Syndrome” (with Co-PIs V. Interrante, D. Keefe, G. Bernstein, C. Conelea, and S. Guy), NSF, October 1, 2019 – September 30, 2024.
- “CPS: TTP Option: Synergy: Collaborative Research: Dynamic Methods of Traffic Control that Impact Quality of Life in Smart Cities” (with Co-PIs J. Hourdos, M. Jovanovic, and S. Guy), NSF, September 15, 2015 – February 28, 2021.
- “Autonomous Mobile Pavement Density Profiling Robot to Reduce Worker Risk”, Mn\DOT, March 14, 2019 – June 30, 2021.
- “SCH: Active Learning for Medical Applications” (with Co-PIs R. Kuang, S. Truskinovsky, and C. Weight), NIH/NCI, February 1, 2018 – January 31, 2022.
- “Maintenance for the Truck Parking Availability System of the State of Kansas,” KDOT, January 1, 2019 – December 31, 2023.
- “Cloud Computing for Kansas Truck Parking Detection and Information System and Verification Tool Development”, KDOT, July 1, 2019 – October 31, 2021.
- “A Real-Time Truck Parking Availability System for the State of Wisconsin”, MnDOT, June 30, 2016 – December 31, 2019.
- “A Real-time Truck Parking Availability System for the State of Kansas”, KDOT, October 1, 2016 – August 31, 2021.
- “MRI: Development of a Solar UAV Instrument” (with Co-PIs M. Hondzo, F. Sotiropoulos, and J. Hong), NSF, October 1, 2015 – March 31, 2022.
- “NRI: Collaborative Research: Robotics 2.0 for Disaster Response and Relief Operations” (with Co-PIs M. Hondzo, and J. Hong), NSF, August 15, 2014 – July 31, 2019.
- “I/UCRC FRP: Collaborative Research: Autonomous Perception and Manipulation in Search and Rescue”, NSF, August 15, 2014 – July 31, 2016.
- “MRI: Development of an Instrument that Monitors Behaviors Associated with Obsessive-Compulsive Behaviors and Schizophrenia” (with Co-PIs K. Lim and G. Bernstein), NSF, October 1, 2013 – September 30, 2021.
- “A Comprehensive System for Assessing Truck Parking Availability”, FHWA and Mn\DOT, January 11, 2012 – November 30, 2016.
- “I/UCRC FRP: Collaborative Research: A Software Framework for Controlling Multi-Robot Teams”, NSF, August 1, 2013 – July 31, 2017.
- “MRI: Development of a Video-Based Robotic Instrument for Behavioral Analysis and Diagnosis of At-Risk Children” (with Co-PIs K. Lim and G. Sapiro), NSF, October 1, 2010 – September 30, 2019.
- “Sensing for HOV/HOT Lanes Enforcement”, Mn\DOT, March 11, 2014 – August 30, 2016.
- “CDI-Type II: Computational Tools for Behavioral Analysis, Diagnosis, and Intervention of at Risk Children” (with Co-PIs K. Lim, G. Sapiro, and A. Banerjee), NSF, September 15, 2010 – August 31, 2016.
- “Center for Safety, Security, and Rescue Robotics” (with M. Gini, T. Hadjiyanni, and S. Roumeliotis), NSF, August 15, 2003 – July 31, 2016.
- I/UCRC Membership, Honeywell Labs, December 1, 2010 – December 30, 2014.
- I/UCRC Membership, Minnesota Corn Growers, December 1, 2013 – December 30, 2015.

Patents

- “Miniature Robotic Vehicles and Methods for Controlling Same" Patent #6,548,982 with Richard Voyles, Bradley Nelson, Paul Rybski, and Donald Krantz.
- “Adjustable Diameter Wheel Assembly, and Methods and Vehicles Using Same" Patent #6,860,346 with Ian Burt.
- “Ruggedized Robotic Vehicles" Patent #7,559,385 with Ian Burt.
- “Crowd Counting and Monitoring" Patent #8,116,564 with Prahlad Kilambi and Osama Masoud.
- “Robotic Vehicle System" Patent #8,260,459 with Sam Herbert.

- **"**Miniature Robotic Vehicle with Ground And Flight Capability**"** Patent #8,342,440 with Alex Kossett**.**
- "Determining Parking Space Occupancy Using a 3D Representation" Patent #9,858,816 with Douglas Cook, Vassilios Morellas, and Theodore Morris.
- "Automated Detection of Nitrogen Deficiency in Crop" Patent #10,599,926 with Vassilios Morellas, Dimitris Zermas, David Mulla, Michael Bazakos, and Daniel Kaiser.
- "Computer Vision for Cancerous Tissue" Patent #11,449,985 with Panagiotis Stanitsas, Anoop Cherian, Vassilios Morellas, and Alexander Truskinovsky.

Courses

- "Introduction to Intelligent Robotic Systems", CS-5551, Fall 2022, evaluation: 4.1/5, registration: 79 students.
- "Introduction to Intelligent Robotic Systems", CS-5551, Fall 2021, evaluation: 4.0/5, registration: 66 students.
- "Introduction to Intelligent Robotic Systems", CS-5551, Fall 2020, evaluation: 4.1/5, registration: 47 students.
- "Artificial Intelligence I", CS-5511, Fall 2019, evaluation: 4.6/5, registration: 56 students.
- "Readings in Computational Vision", CS-8980, Spring 2019, evaluation: 4.8/5, registration: 28 students.
- "Artificial Intelligence I", CS-5511, Fall 2018, evaluation: 4.8/5, registration: 67 students.
- "Computer Vision", CS-5561, Spring 2018, evaluation: 4.5/5, registration: 54 students.
- "Artificial Intelligence I", CS-5511, Fall 2017, evaluation: 4.7/5, registration: 70 students.
- "Readings in Computational Vision", CS-8980, Spring 2017, evaluation: 4.9/5, registration: 13 students.
- "Algorithms and Data Structures", CS-4041, Fall 2016, evaluation: 4.8/5, registration: 77 students.
- "Computer Vision", CS-5561, Spring 2016, evaluation: 4.4/5, registration: 46 students.
- "Introduction to Intelligent Robotic Systems", CS-5551, Fall 2015, evaluation: 4.2/5, registration: 38 students.
- "Algorithms and Data Structures", CS-4041H, Fall 2014, evaluation: 4.7/5, registration: 13 students.
- "Readings in Computational Vision", CS-8980, Spring 2014, evaluation: 4.8/5, registration: 12 students.
- "Artificial Intelligence I", CS-5511, Fall 2013, evaluation: 4.3/5, registration: 33 students.
- "Computer Vision", CS-5561, Spring 2013, evaluation: 4.0/5, registration: 32 students.
- "Artificial Intelligence I", CS-5511, Fall 2012, evaluation: 4.2/5, registration: 47 students.
- "Computer Vision", CS-5561, Spring 2012, evaluation: 4.6/5, registration: 24 students.
- "Artificial Intelligence I", CS-5511, Fall 2011, evaluation: 4.4/5, registration: 53 students.
- "Readings in Computational Vision", CS-8980, Spring 2011, evaluation: 4.6/5, registration: 20 students.
- "Artificial Intelligence I", CS-5511, Fall 2010, evaluation: 4.4/5, registration: 55 students.
- "Computer Vision", CS-5561, Spring 2010, evaluation: 4.6/5, registration: 25 students.
- "Artificial Intelligence I", CS-5511, Fall 2009, evaluation: 4.6/5, registration: 26 students.
- "Readings in Computational Vision", CS-8980, Spring 2009, evaluation: 4.6/5, registration: 24 students.
- "Introduction to Intelligent Robotic Systems", CS-5551, Fall 2008, evaluation: 4.6/5, registration: 33 students.
- "Computer Vision", CS-5561, Spring 2008, evaluation: 4.5/5, registration: 23 students.
- "Readings in Computational Vision and Robotics", CS-8980, Spring 2007, evaluation: 4.2/5, registration: 26 students.
- "Artificial Intelligence I", CS-5511, Fall 2006, evaluation: 3.7/5, registration: 60 students.
- "Computer Vision", CS-5561, Spring 2006, evaluation: 3.5/5, registration: 50 students.
- "Artificial Intelligence I", CS-5511, Fall 2005, evaluation: 3.1/5, registration: 60 students.
- "Readings in Computational Vision", CS-8980, Spring 2005, evaluation: 4.0/5, registration: 22 students.
- "Computer Vision", CS-5561, Spring 2004, evaluation: 3.2/5, registration: 28 students.
- "Artificial Intelligence I", CS-5511, Fall 2003, evaluation: 3.8/5, registration: 69 students.
- "Readings in Computational Vision", CS-8980, Spring 2003, evaluation: 4.4/5, registration: 19 students.

- “Introduction to Intelligent Robotic Systems”, CS-5551, Fall 2002, evaluation: 4.1/5, registration: 32 students.
- “Computer Vision”, CS-5561, Spring 2002, evaluation: 4.5/5, registration: 31 students.
- “Artificial Intelligence I”, CS-5511, Fall 2001, evaluation: 4.1/5, registration: 68 students.
- “Computer Vision”, CS-5561, Spring 2001, evaluation: 4.2/5, registration: 40 students.
- “Senior Design Project”, ECE-4951, Spring 2001, registration: 5 students.
- “Algorithms and Data Structures”, CS-4041, Spring 2001, evaluation: 3.5/5, registration: 137 students.
- “Computer Vision”, CS-5561, Spring 2000, evaluation: 4.2/5, registration: 34 students.
- “Intelligent Agents”, CS-8551, Fall 1999, evaluation: 4.5/5, registration: 32 students.
- “Algorithms and Data Structures II”, CS-3322, Spring 1999, evaluation: 4.3/5, registration: 151 students.
- “Computer Vision”, CS-5561, Fall 1998, evaluation: 3.3/5, registration: 25 students.
- “Algorithms and Data Structures II”, CS-3322, Spring 1998, evaluation: 4.0/5, registration: 121 students.
- “Readings in Computational Vision”, CS-8561, Winter 1998, evaluation: 3.9/5, registration: 12 students.
- “Computer Vision”, CS-5561, Fall 1997, evaluation: 3.9/5, registration: 34 students.
- “Introduction to Intelligent Robotic Systems”, CS-5551, Spring 1997, evaluation: 4.4/5, registration: 22 students.
- “Algorithms and Data Structures II”, CS-3322, Winter 1997, evaluation: 4.1/5, registration: 55 students.
- “Algorithms and Data Structures II”, CS-3322, Spring 1996, evaluation: 3.9/5, registration: 95 students.
- “Readings in Computational Vision”, CS-8561, Winter 1996, evaluation: 4.8/5, registration: 12 students.
- “Computer Vision”, CS-5561, Fall 1995, evaluation: 4.1/5, registration: 15 students.
- “Algorithms and Data Structures II”, CS-3322, Spring 1995, evaluation: 3.9/5, registration: 77 students.
- “Computer Vision”, CS-5561, Winter 1995, evaluation: 4.1/5, registration: 22 students.
- “Introduction to Intelligent Robotic Systems”, CS-5551, Fall 1994, evaluation 3.9/5, registration: 24 students.
- “Algorithms and Data Structures II”, CS-3322, Spring 1994, evaluation: 4.0/5, registration: 62 students.
- “Readings in Computational Vision”, CS-8561, Winter 1994, evaluation: 4.3/5, registration: 14 students.
- “Computer Vision”, CS-5561, Fall 1993, evaluation: 4.5/5, registration: 34 students.
- “Problems in Artificial Intelligence”, CS-5599, Spring 1993, evaluation: 4.4/5, registration: 20 students.
- “Algorithms and Data Structures II”, CS-3322, Winter 1993, evaluation: 4.2/5, registration: 71 students.
- “Computer Vision”, CS-5561, Fall 1992, evaluation: 4.3/5, registration: 13 students.

Courses Introduced

- “Introduction to Intelligent Robotic Systems”, CS-5551.
- “Program Design and Development”, CS-3081W.

Students

- Patrick Lau, Ph.D. student (graduated, Thesis title: “A Maximum Variance Approach to Basis Selection for Image Transformation,” National University of Singapore).

- Christopher Smith, Ph.D. student (graduated, recipient of the Graduate School Doctoral Dissertation Fellowship, Thesis title: “Visually Guided Manipulation of Static and Moving Objects,” Associate Professor, Lake Superior State University).
- Ioannis Pavlidis, Ph.D. student (graduated, Thesis title: “Physics-Based Methodologies for Recognizing Handwritten Signatures, Words, and Line Drawings,” Full Professor, University of Houston).
- Rahul Singh, Ph.D. student (graduated, Thesis title: “Shape Recognition by Shape Morphing and its Applications in Vision-Based Robotics,” Professor, San Francisco State University).
- Osama Masoud, Ph.D. student (graduated, Thesis title: “Tracking and Analysis of Articulated Motion with an Application to Human Motion,” Director of Research, Vital Images Inc.).
- Doug Perrin, Ph.D. student (graduated, Thesis title: “Vision-Based Tasks and Dynamic Contours,” Assistant Professor, Harvard Medical School).
- Sascha Stoeter, Ph.D. student (graduated, Thesis title: “Vision-based Control of Miniature Jumping Scout Robots,” Research Scientist, Hitachi ABB, Switzerland).
- Robert Bodor, Ph.D. student (graduated, Thesis title: “Multi-camera Human Activity Recognition in Unconstrained Indoor and Outdoor Environments,” CEO, ProtoLabs Inc.).
- Harini Veeraraghavan, Ph.D. student (graduated, Thesis title: Learning to Extract Interesting Events from Outdoor Image Sequences,” Research Scientist, Memorial Sloan Kettering Cancer Center).
- Monica Anderson, Ph.D. student (graduated, Thesis title: “Efficient Cooperative Multi-robot Team Search in Complex Indoor Environments,” Associate Professor, University of Alabama).
- Esra Kadioglu-Urtis, Ph.D. student (graduated, Thesis title: “Multi-Angle Pursuit of a Moving Target Using Mobile Robots,” Assistant Professor, Macalester College).
- Andrew Drenner, Ph.D. student (graduated, Thesis title: “A Framework for Distributed Mobile Robotics,” ReconRobotics Inc.).
- Evan Ribnick, Ph.D. student (graduated, Thesis title: “Inferring the 3D Structure of Periodic Motion in Video,” Reveal Technology).
- Nathaniel Bird, Ph.D. student (graduated, Thesis title: “Calibration and Component Placement in Structured Light Systems for 3D Reconstruction Tasks,” Staff Research Engineer, Abbott).
- Ajay Joshi, Ph.D. student (graduated, Thesis title: “Image Classification with Minimal Supervision”, Google Inc.).
- Amer Agovic, Ph.D. student (graduated, Thesis title: “Interface Issues in Robot Scrub Nurse Design”, Upperbound Technologies Inc.).
- Brett Hemes, Ph.D. student (graduated, Thesis title: “Locomotion of Serial Multiply-Actuated Tumbling Robots”, 3M).
- Stefan Atev, Ph.D. student (graduated, Thesis title: “Using Assymetry in the Spectral Clustering of Trajectories”, ProtoLabs Inc.).
- Hyeun J. Min, Ph.D. student (graduated, Thesis title: “Multi-Robot Formations and Cooperation with Visual Tracking Techniques”, Assistant Professor, Ajou University, Korea).
- Guruprasad Somasundaram, Ph.D. student (graduated, Thesis title: “Global Self Similarity and Saliency Measures Based on Sparse Representations for Classification of Objects and Spatio-temporal Sequences”, Meta).
- Anoop Cherian, Ph.D. student (graduated, Thesis title: “Similarity Search in Visual Data”, Mitsubishi Electric Research Laboratories).
- Duc Fehr, Ph.D. student (graduated, “Covariance Based Point Cloud Descriptors for Object Detection and Classification”, The Goodyear Tire & Rubber Company).
- Michael Janssen, Ph.D. student (graduated, “Robot Games: Translating Game Interaction to Robotic Interface”, Google).
- Ravishankar Sivalingam, Ph.D. student (graduated, “Sparse Models for Positive Definite Matrices”, Qualcomm).
- Jon Andersh, Ph.D. student (graduated, “Modeling the Human Visuo-Motor System for Remote-Control Operation”).
- Nicholas Walczak, Ph.D. student (graduated, “A Multi-Sensor RGB-D System for Preschool Classroom Behavior Analysis”, BBN).
- Joshua Fasching, Ph.D. student (graduated, “Behavior Monitoring Using Visual Data and Immersive Environments”, BBN).
- Panos Stanitsas, Ph.D. student (graduated, “Machine Learning Methods with Emphasis on Cancerous Tissue Recognition”, Insitro Inc.).

- Demetris Zermas, Ph.D. student (graduated, “Combining Machine Learning with Computer Vision for Precision Agriculture Applications, Sentera).
- William Beksi, Ph.D. student (graduated, “Topological Methods for 3D Cloud Processing”, Assistant Professor, University of Texas Arlington).
- Ruben D’Sa, Ph.D. student (graduated, “Design of a Transformable Unmanned Aerial Vehicle”, Talos Robotics).
- Nick Heller, Ph.D. student (WPE passed and proposal completed).
- Dario Canelon-Suarez, Ph.D. student (WPE passed and proposal competed).
- Athanasios Bacharis, Ph.D. student (WPE passed).
- Henry Nelson, Ph.D. student (WPE passed).
- Robert Martin, Ph.D. student (WPE passed).
- Rahul Singh, M.S. student (graduated).
- Marty Kenner, M.S. student (graduated).
- Yue Du, M.S. student (graduated).
- Mike Sullivan, M.S. student (graduated).
- Ioannis Pavlidis, M.S. student (graduated).
- Scott Brandt, M.S. student (graduated).
- Richard Nelson, M.S. student (graduated).
- Charles Richards, M.S. student (graduated).
- Jianzhong Xu, M.S. student (graduated).
- Alex Ozerkovsky, M.S. student (graduated).
- Igor Chechelnitsky, M.S. student (graduated).
- Martin Eriksson, M.S. student (graduated).
- Robert Sfarzo, M.S. student (graduated).
- Doug Perrin, M.S. student (graduated).
- Singh Kaur Sarbjit, M.S. student (graduated).
- Rotherick Tan, M.S.student (graduated).
- Thai Nguyen, M.S. student (graduated).
- Scott Rogers, M.S. student (graduated).
- Surendra Gupte, M.S. student (graduated).
- Brian Chapeau, M.S. student (graduated).
- Janice Pearce, M.S. student (graduated).
- Justin Thomas, M.S. student (graduated).
- Eric Wahlstrom, M.S. student (graduated).
- Bradley Kratochvil, M.S. student (graduated).
- Robert Martin, M.S. student (graduated).
- Harini Veeraraghavan, M.S. student (graduated).
- Andreas Robinson, M.S. student (graduated).
- Chuck Hays, M.S. student (graduated).
- Wiiliam Toczyski, M.S. student (graduated).
- Ian Burt, M.S. student (graduated).
- Nathaniel Bird, M.S. student (graduated).
- Prahlad Kilambi, M.S. student (graduated).
- Thanh Nguyen, M.S. student (graduated).
- Stefan Atev, M.S. student (graduated).
- Sushanth Rajasankar, M.S. student (graduated).
- Evan Ribnick, M.S. student (graduated).
- Jason Sollom, M.S. student (graduated).
- Ajay Joshi, M.S. student (graduated).
- Guruprasad Somasundaram, M.S. student (graduated).
- Pushkar Modi, M.S. student (graduated).
- Max Walter, M.S. student (graduated).
- Ravishankar Sivalingam, M.S. student (graduated).
- Alex Ivkin, M.S. student (graduated).
- Anoop Cherian, M.S. student (graduated).
- Vineet Bhatawadekar, M.S. student (graduated).
- Justin Dancs, M.S. student (graduated).

- Apostolos Kottas, M.S student (graduated).
- Andrew Carlson, M.S. student (graduated).
- Kuo-Shih Tseng, M.S. student (graduated).
- Nicholas Walczak, M.S. student (graduated).
- Joshua Fasching, M.S. student (graduated).
- Alex Kossett, M.S student (graduated).
- Alexander Popov, M.S student (graduated).
- Eric Holec, M.S student (graduated).
- Sydney Bergeron, M.S. student (graduated).
- Paul Hed, M.S. student (graduated).
- Ruben D'Sa, M.S. student (graduated).
- Karthik Buddha, M.S. student (graduated).
- Travis Henderson, M.S. student (graduated).
- Jamsrandorj Dagvadorj, M.S. student (graduated).
- Luis Guzman, M.S. student (graduated).
- Matthew Tlachac, M.S. student (graduated).
- Zixing Wang, M.S. student (graduated).
- Zane Smith, M.S. student (graduated).
- Athanasios Bacharis, M.S. student (graduated).
- Haoyi Shi, M.S. student.
- Haoyuan Du, M.S. student.
- Nikhilanj Venkata Pelluri, M.S. student.
- Scott Morton, M.S. student.
- P. Lee, L. Fiore, J. Purvey, A. Kossett, S. Kristoff, E. Holec, A. Carlson, F. Bazakos, A. Hambrock, A. Kottas, C. McMillen, C. Carlson, R. Cyrus, M. Belsky, Z. Johnson, K. Stubbs, I. Burt, G. Miller, E. Mueller, D. Goerke, M. Eriksson, S. Morton, R. D'sa, B. Neubauer, R. Redmond, W. Krepps, D. Tormoen, B. Bosch, A. Erickson, B. Gundrum, L. Scharber, I. Poteryakhin, Z. Stromquist, P. Wyman, D. Jenson, J. Spruth, T. Henderson, A. Young, N. Studanski, J. Killian, B. Schulz, M. Mikkelsen, M. Calvert, T. Heller, M. Diaz, S. Marquart, S. Paladugu, P. Leppink – Shands, C. Uebelhart, J. Dean, A. Schwartzwald, A. Shah, I. Mitha, S. Somrock, L. McCullough, R. Smith, E. Bowe, R. Favour, M. Sonnabend, J. Rickman, M. Smith, A. Johnson, and H. Stephenson (supported undergraduates).
- Frederic Lemauff, David Boutouiller, Nicolas Bernardeau, Olivier Huet, Guillaume Gasser, Chris Dos Santos, Nicolas Caramelli, Eric Bouteillon, Benjamin Maurin, Duc Fehr, Patrick Roessler, Arnaud Bruyas, and Florent Nageotte (supported foreign undergraduate students).
- J. Jasper, M. Smela, A. DeClue, and B. Asojo (supported high school students).

Post-Doctoral Associates

- Osama Masoud (currently: Director of Research, Vital Images Inc.).
- Vassilios Morellas (currently: Research Professor, UMN).
- Dean Hougen (currently: Associate Professor, University of Oklahoma).
- Yan-Bin Jia (currently: Professor, Iowa State University).

Participation in M.S. and Ph.D. Thesis Committees

Falai Li (Agriculture), Paul Rybski (CS), Hemanth Arumugam (CS), Kemal Berk Yesin (ME), Tracy Denk (EE), Don Krantz (CS), Pascal Mammasian (Psychology), Weining Zheng (EE), Huifuang Ng (Agriculture), Dean Hougen (CS), Pamela Lechleider (CS), Dirk Edmonds (CS), Bin Zhu (EE), You Yuli (EE), Vafa Ghazi-Moghadam (EE), Lan Tse-Hua (EE), Shaomin Peng (EE), John Chourdakis (CE), Liu Guoqin (CE), Todd Hardwick (EE), Saad Bedros (EE), John Shackleton (CS), Keesook Han (EE), Omar Santiago-Perez (ME), Rajeev Singh (AEM), Jennifer Treadway (Math), Bill Knecht (Psychology), Xuan

Liu (CS), Barmeshwar Vikramaditya (ME), Youngguyn Kim (EE), Praveen Gupta (Agriculture), Brad Nelson (Carnegie Mellon University), Mike Brady (Psychology), Jeff Thompson (CS), Kihyuk Han (ECE), Yu Zhou (ME), Paul Rybski (CS), Jianjun Zhan (CE), Matt Cruikshank (CS), Joshua Dudney (ME), Vinodh Kumar Chandram (CS), Saed Wadi (ECE), Seth Hulst (ECE), Vahid Emamian (ECE), Thomas Naselaris (Neuroscience), Michael Blocksome (CS), David Littau (CS), Yunqian Ma (ECE), Sunghee Kim (CS), A. Schoolcraft (CS), T. Corrigan (ME), G. Yang (ME), H. Yang (AEM), Jim Gaines (ME), Kraig Bottemiller (ECE), M. Lahmar (ME), Blake Larson (ME), Michael Baldea (Chem. Engin.), Rahul Joshi (ECE), Corey Bilot (CS), Dongwei Cao (CSE), Gerry Ruch (Astronomy), Rashmi Sundareswara (CSE), Yukikazu Hidaka (CSE), Luke Ludwig (CSE), Maitreyi Nanjanath (CSE), Nicole Sprague (CSE), Diego Rother (CompS), Tom Whipple (CSE), Vasillios Christopoulos (CSE), Steve Tousignant (CSE), Chen-chi Chu (AEM), Venkateshwar Korukanti (CSE), Chandra Tjhai (AEM), Ryan Lloyd (CSE), Nikhil Karnad (CSE), Ankur Sharma (CSE), Anuraag Pakanati (CSE), Elizabeth Jensen (CSE), Ignacio Ramirez (Scientific Computation), Xue Bai (ECE), Doug Cook (CSE), James Parker (CSE), Alexey Castrodad (ECE), Jordan Hashemi (ECE), Liron Yatziv (Scientific Computation), David Brajkovic (ME), Pratap Tokekar (CSE), Rodney Dockter II (ME), Mrinal Kanti Paul (CSE), John Harwell (CSE), Leonardo Le (AEM), Ahmed Medhat (CSE), Nikolaos Stefas (CSE), Robert Giaquinto (CSE), Kevin Mallery (ME), Baoquan Zhang (CSE), Debraj Bhattacharjee (ECE), Aditya Salapaka (ME), Sirisha Rambhatla (ECE), Sadman Enan (CSE), Abhinav Sambasivan (ECE), Abhinav Mehta (ME), Rostand Fezeu (CSE), Kazim Engin (CSE), Jungseok Hong (CSE), Sara Saunders (BME), Bobby Schulz (ECE), Jonathan Lemke (ME), Thomas Ringstrom (CSE), Udhaya Dayalan (CSE), Jared Floersch (ME), Shree Thandry Ramamurthy (ECE), Debarati Das (CSE), Praneet Bala (CSE), Yifeng Zhang (CSE), Ross Worobel (ECE), Tejveer Maddukuri (CSE), Angel Sylvester (CSE), Ruixuan Sun (CSE), Mo Houtti (CSE), Zhejun Liu (CE), James Klassen (NRSM), and Rong Chen (EE).

Honors

- UMN Award for Outstanding Contributions to Graduate and Professional Education, Distinguished University Teacher, 2022-.
- McKnight Presidential Endowed Professor in CS, 2016-.
- IEEE RAS George Saridis Leadership Award in Robotics and Automation, 2016.
- CTS Research Partnership Award, 2016.
- A paper co-authored with A. Cherian and V. Morellas was the winner for the Best Student paper award at the 2012 IEEE Int. Conference on Image Processing (ICIP 2012), Orlando, FL, October 2012.
- IEEE-RAS Distinguished Service Award, 2011.
- Distinguished McKnight University Professor, 2007-.
- IEEE Felllow, 2007-.
- A paper co-authored with G. Gasser, N. Bird, and O. Masoud was finalist for the Best Vision Paper Award, 2004 IEEE Int. Conference on Robotics and Automation, New Orleans, April 2004.
- IEEE VTS 2001 Best Land Transportation Paper Award for the paper "A Novel Method for Tracking and Counting Pedestrians in Real-Time Using a Single Camera" (with Osama Masoud).
- Best Video Award, 2000 IEEE Int. Conference on Robotics and Automation, San Francisco, May 2000.
- Finalist for the 2000 Discover Magazine Award for Technological Innovation.
- UMN CSE Faculty Creativity Award, March 1999.
- McKnight Land-Grant Professorship Award, University of Minnesota, July 1995 - June 1997.
- Best Session Paper Presentation Award, American Control Conference, Seattle, June 1995.
- National Science Foundation Career Award, August 1995 - July 1998.
- National Science Foundation Research Initiation Award, August 1994 - July 1997.
- Finalist for the Anton Philips Award for Best Student Paper in the 1991 IEEE Robotics and Automation Conference.
- Kritski Fellowship, Greece, September 1985 - August 1987.
- IKY Fellowship, Greece, August 1986 - August 1987.
- First entrant at Ionidios High School, Piraeus, Greece.
- Seventh entrant at the Department of Electrical and Computer Engineering, National Technical University of Athens.

Presentations

- 14th Cyprus Workshop on Signal Processing and Informatics, Nicosia, Cyprus, July 2022.
- ETH MSRL Robotics Symposium, May 2022.
- 3M Technical Forum Seminar, April 2022.
- IEEE Southern Minnesota Section, August 2020.
- 3M Mini Dental School Lecture Series, July 2020.
- NRI meeting, Breakout Research in Agricultural Robotics, February 2020.
- CSE Dean's Advisory Committee, University of Minnesota, Minneapolis, MN, October 2019.
- Robotics Roadmap Workshop, Chicago, IL, September 2019.
- 12th Cyprus Workshop on Signal Processing and Informatics, Nicosia, Cyprus, July 2019.
- 27th Mediterranean Conference on Control and Automation (MED '19), Akko, Israel, July 2019.
- University of Minnesota Robotics Tech Talks, Minneapolis, MN, April 2019.
- Electrical and Computer Engineering, University of Florida, FL, April 2019.
- Mechanical and Aerospace Engineering, University of Florida, FL, April 2019.
- Minnesota Dermatological Society Winter Meeting, Minneapolis, MN, November 2018.
- UMN IEM HS Inspire, Minneapolis, MN, November 2018.
- Science Museum of Minnesota, St. Paul, MN, October 2018.
- "Machine Learning and Artificial Intelligence in Medical Imaging: Challenges and Opportunities" Workshop, Arlington, VA, September 2018.
- Distinguished Lecture, Computer Science and Engineering, Texas A&M, College Station, TX, January 2018.
- Robotics Frontiers 2017 Symposium, UC San Diego, San Diego, CA, September 2017.
- Honeywell Technology Symposium, Minneapolis, MN, May 2017.
- IMA Smart Urban Transportation Forum, IMA, University of Minnesota, Minneapolis, MN, May 2017.
- Energy Explorers, Great River Energy, Maple Grove, MN, February 2017.
- Distinguished Lecture, Computer Science and Engineering, Texas A&M, College Station, TX, December 2016.
- Institute for Robotics & Intelligent Machines (IRIM), Georgia Tech, Atlanta, GA, January 2016.
- Purdue Polytechnic Institute, Purdue University, West Lafayette, IN, September 2015.
- 8th Cyprus Workshop on Signal Processing and Informatics, Nicosia, Cyprus, July 2015.
- 2015 Heritage Society Dinner, University of Minnesota Foundation, Minneapolis, MN, June 2015.
- Headliners, College of Continuing Education, University of Minnesota, St. Paul, MN, April 2015.
- Department of Computer Science and Engineering, University of Nevada, Reno, NV, March 2015.
- Electrical and Computer Engineering, Duke University, Durham, NC, February 2015.
- Department of Computer Science, Iowa State University, Ames, IA, February 2015.
- 7th Cyprus Workshop on Signal Processing and Informatics, Nicosia, Cyprus, July 2014.
- IEEE Conference on Robotics and Automation, Hong Kong, China, June 2014.
- Department of Computer Science and Engineering, Minneapolis, MN, November 2013.
- Robotics Alley Conference, St. Paul, MN, November 2013.
- 2013 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS '13), Tokyo, Japan, November 2013.
- GOFIRST UMN, Minneapolis, MN, October 2013.
- IEEE Region 4 Leadership Conference, Minneapolis, MN, October 2013.
- Enterprise Minnesota, Maple Grove, MN, September 2013.
- 6th Cyprus Workshop on Signal Processing and Informatics, Nicosia, Cyprus, July 2013.
- MN Corn Growers, Waseca, MN, March 2013.
- GOFIRST UMN, Minneapolis, MN, February 2013.
- 2012 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS '12), Vilamoura/Algarve, Portugal, October 2012.
- ETH Distinguished Lecture, Zurich, Switzerland, October 2012.
- IEEE Conference on Robotics and Automation, St. Paul, MN, May 2012.
- Department of Mechanical Engineering, University of Minnesota, Minneapolis, MN, April 2012.

- CSE Science and Engineering Day, University of Minnesota, Minneapolis, MN, February 2012.
- University of Minnesota | Rochester, Rochester, MN, February 2012.
- CTS Executive Committee Meeting, University of Minnesota, Minneapolis, MN, February 2012.
- 1st Robotics Alley Conference, Minneapolis, MN, November 2011.
- CSE Dean's Advisory Committee, University of Minnesota, Minneapolis, MN, October 2011.
- 4th Cyprus Workshop on Signal Processing and Informatics, Nicosia, Cyprus, July 2011.
- 19th Mediterranean Conference on Control and Automation (MED' 11), Corfu, Greece, June 2011.
- 3M, St. Paul, MN, May 2011.
- "Educating Robotics Engineers and Scientists" Workshop, IEEE Conference on Robotics and Automation, Shanghai, China, May 2011.
- IEEE Conference on Robotics and Automation, Shanghai, China, May 2011.
- Normandale Community College, Minneapolis, MN, January 2011.
- Tech Forum Electronics Chapter, 3M, St. Paul, MN, November 2010.
- 3rd Cyprus Workshop on Signal Processing and Informatics, Nicosia, Cyprus, July 2010.
- 18th Mediterranean Conference on Control and Automation (MED' 10), Marrakech, Morocco, June 2010.
- IEEE Conference on Robotics and Automation, Anchorage, Alaska, May 2010.
- Tech Forum Electronics Chapter, 3M, St. Paul, MN, December 2009.
- Normandale Community College, Minneapolis, MN, October 2009.
- 2009 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS '09), Saint Louis, MO, August 2009.
- 17th Mediterranean Conference on Control and Automation (MED '09), Salonica, Greece, June 2009.
- IEEE Conference on Robotics and Automation, Kobe, Japan, May 2009.
- Department of Computer Science and Engineering, Texas A&M, TX, January 2009.
- IEEE Aerospace and Electronic Systems Society, Chapter of Twin Cities, Eagan, MN, December 2008.
- IEEE International Conference on Advanced Video and Signal Based Surveillance, Santa Fe, NM, September 2008.
- 1st International Conference on PErvasive Technologies Related to Assistive Environments (PETRA '08), Athens, Greece, July 2008.
- 11th International Symposium on Experimental Robotics, Athens, Greece, July 2008.
- Science Museum of Minnesota, St. Paul, MN, June 2008.
- IEEE Conference on Robotics and Automation, Pasadena, CA, May 2008.
- ARO/NSF Workshop on Future Directions in Visual Navigation, Pasadena, CA, May 2008.
- National Science Foundation PAEMST Award Ceremony, Washington, DC, April 2008.
- Midwest Instruction and Computing Symposium, UW-La Crosse, La Crosse, WI, April 2008.
- Lockheed Martin Corporation, MN, April 2008.
- Center for Cognitive Sciences, MN, January 2008.
- Metro Transit, MN, January 2008.
- Computer Science Department, University of Southern California, CA, December 2007.
- The Technical Cooperation Program (TTCP) Symposium on the Science of Autonomy and Bio-Inspired Systems, Army Research Laboratory, MD, October 2007.
- Honeywell ACS Fellows Symposium, Minneapolis, MN, October 2007.
- Goodrich Corporation, MN, June 2007.
- IEEE Conference on Robotics and Automation, Rome, Italy, April 2007.
- Center for Cognitive Sciences, MN, March 2007.
- North Dakota State University, ND, January 2007.
- Digital Technology Workshop, Digital Technology Center, November 2006.
- Metropolitan Airport Commission, October 2006.
- Metro Transit, September 2006.
- Johnson Controls Inc., May 2006.
- Honeywell Labs, March 2006.
- 2005 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS '05), Edmonton, Canada, August 2005.
- 13th Mediterranean Conference on Control and Automation (MED'05), June 2005.
- Tutorial "Video Surveillance", 2005 Spring NSF SSR-RC meeting, St. Petersbourgh, FL, March 2005.
- Workshop "Micro-Air-Vehicles - The Next 10 Years", 2004 IEEE Int. Conference on Robotics and Automation (ICRA '04), New Orleans, LA, April 2004.

- Workshop “Multi-robot Search and Rescue: Current Challenges and Future Directions”, 2004 IEEE Int. Conference on Robotics and Automation (ICRA ’04), New Orleans, LA, April 2004.
- Department of Electrical and Computer Engineering, University of Arizona, April 2004.
- Department of Electrical, Computer, and Systems Engineering, Rensselaer Polytechnic Institute, February 2004.
- Department of Electrical and Systems Engineering, Washington University in Saint Louis, January 2004.
- Department of Computer and Information Science, Ohio State University, January 2004.
- Department of Computer Science, University of North Carolina, December 2003.
- Workshop “Robotics in Emergency Response”, 2003 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS ’03), Las Vegas, NV, October 2003.
- Workshop “Control and Cooperation of Intelligent Miniature Robots”, 2003 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS ’03), Las Vegas, NV, October 2003.
- Department of Computer Science, University of Houston, October 2003.
- IEEE Conference on Robotics and Automation, Taipei, Taiwan, September 2003.
- 11th Mediterranean Conference on Control and Automation (MED’03), June 2003.
- Department of Computer Science and Engineering, Wright State University, May 2003.
- Digital Technology Center Industrial Affiliates Open House, May 2003.
- Picatinny Arsenal, NJ, May 2003.
- Computer and Information Science Department, University of Pennsylvania, February 2003.
- 3M Optical Inspection Mini-Chapter, February 2003.
- Digital Technology Center Seminar, December 2002.
- 2002 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS '02), Lausanne, Switzerland, October 2002.
- 14th International Conference on Digital Signal Processing, Santorini, Greece, 2002.
- ARO Workshop on Integrated System Approaches to Future Combat Systems, Washington, DC, May 2002.
- Multi-Robot Systems Workshop, Washington, DC, March 2002.
- Vision Science Colloquium, University of Minnesota, Minneapolis, MN, November 2001.
- Naval Research Laboratory (NRL), Washington, DC, November 2001.
- 2001 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS '01), Maui, HI, October 2001.
- IEEE Conference on Robotics and Automation, Seoul, Korea, May 2001.
- IEEE Twin Cities Chapter, Minneapolis, MN, April 2001.
- Department of Electrical and Computer Engineering, University of New Mexico, NM, March 2001.
- AHEPANS, St. Paul, MN, USA, March 2001.
- Department of Electrical and Computer Engineering, University of Cyprus, Cyprus, February 2001.
- 2nd NASA/JPL Workshop on Biomorphic Explorers, Pasadena, CA, December 2000.
- Science Coalition Day, Washington, DC, July 2000.
- Department of Electrical and Computer Engineering, University of Patras, Greece, July 2000.
- 8th IEEE Mediterranean Conference on Control and Automation, Rio, Greece, July 2000.
- Department of Mechanical Engineering, National Technical University, Athens, Greece, July 2000.
- IEEE Conference on Robotics and Automation, San Francisco, CA, May 2000.
- Minnesota Society of Professional Engineers, Minneapolis, USA, April 19, 2000.
- Control Science and Dynamical Systems, University of Minnesota, Minneapolis, USA, March 2000.
- Department of Computer Science and Engineering, University of Minnesota, Minneapolis, USA, November 1999.
- 1999 IEEE/IEEJ/JSAI International Conference on Intelligent Transportation Systems, Tokyo, Japan, October 5-8, 1999.
- 1999 European Control Conference, Karlsruhe, Germany, August 31-September 3, 1999
- ITS Minnesota Annual Meeting and Guidestar Technology Forum, Minneapolis, MN, March 1999.
- University of Minnesota Foundation, Minneapolis, MN, February 1999.
- IMA Workshop on “Forging an Appropriate Immune Response as a Problem in Distributed Artificial Intelligence”, Minneapolis, MN, October 1998.
- 1998 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS '98), Victoria, Canada, October 1998.
- ETH and MOVIC ’98, Switzerland, August 1998.
- DARPA “Distributed Robotics” PI meeting, August 1998.

- IEEE Conference on Robotics and Automation, Leuven, Belgium, May 1998.
- Workshop on “Robust Vision for Vision-Based Control”, IEEE Conference on Robotics and Automation, Leuven, Belgium, May 1998.
- CTS Faculty Round Table, Minneapolis, MN, March, 1998.
- Wright Patterson Base, Dayton, OH, January, 1998.
- Conference on Vision for Reach and Grasp, Minneapolis, MN, October 1997.
- NSF Block Island Workshop on Vision and Control, Block Island, RI, June 1997.
- 1997 Int. Robots and Vision Conference, Detroit, MI, May 1997.
- IEEE Conference on Robotics and Automation, Albuquerque, NM, April 1997.
- CTS Faculty Seminar Series, Minneapolis, MN, February, 1997.
- Department of Computer Science, University of Cyprus, Nicosia, Cyprus, September 1996.
- Department of Computer Science, University of Minnesota, Minneapolis, USA, March 1996.
- Workshop on Mathematical Methods in Computer Vision, Geometry Center, University of Minnesota, Minneapolis, USA, September 1995.
- 10th IEEE International Symposium on Intelligent Control, Monterey, USA, August 1995.
- 1995 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS '95), Pittsburgh, USA, August 1995.
- 3rd IEEE Mediterranean Symposium on New Directions in Control and Automation, Limassol, Cyprus, July 1995.
- Department of Computer Science, University of Cyprus, Nicosia, Cyprus, July 1995.
- 1995 American Control Conference (Two Talks), Seattle, USA, June 1995.
- IEEE Conference on Robotics and Automation, Nagoya, Japan, May 1995.
- Center for Transportation Studies Faculty Seminar, University of Minnesota, Minneapolis, USA, February 1995.
- 33rd IEEE Conference on Decision and Control (33rd CDC), Orlando, USA, December 1994.
- Department of Mechanical Engineering, University of Minnesota, Minneapolis, USA, November 1994.
- SPIE's International Symposium on Photonics for Industrial Applications, Intelligent Vehicle Highway Systems, Boston, USA, November 1994.
- IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems, Las Vegas, USA, October 1994.
- IEEE Conference on Robotics and Automation (Two Talks), San Diego, USA, May 1994.
- Fifth Annual Transportation Research Conference, Minneapolis, USA, May 1994.
- 31st Allerton Conference, Champaign, USA, September 1993.
- 1993 IEEE International Symposium on Intelligent Control, Chicago, USA, August 1993.
- Department of Computer Science, University of Wisconsin, Madison, USA, August 1993.
- 1993 IEEE Conference on Computer Vision and Pattern Recognition, New York, USA, June 1993.
- 1993 American Control Conference, San Francisco, USA, June 1993.
- Department of Electrical Engineering, University of Minnesota, Minneapolis, USA, May 1993.
- Fifth Topical Meeting on Robotic and Remote Systems, Oak Ridge, USA, April 1993.
- 31st IEEE Conference on Decision and Control (31st CDC), Tucson, USA, December 1992.
- IEEE Workshop on Applications of Computer Vision, Palm Springs, USA, November 1992.
- Department of Computer Science, University of Minnesota, Minneapolis, USA, November 1992.
- 1992 American Control Conference, Chicago, USA, June 1992.
- Department of Electronic Engineering, Technical University of Crete, Greece, June 1992.
- Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA, March 1992.
- Department of Computer Science, University of Minnesota, Minneapolis, USA, February 1992.
- Center for Automation Research, University of Maryland, College Park, USA, January 1992.
- European Robotics and Intelligent Systems Conference, Corfu, Greece, June 1991.
- IEEE Conference on Robotics and Automation, Sacramento, USA, April 1991.
- Ohio State University Control Workshop, Columbus, USA, April 1991.
- IEEE Rensselaer Polytechnic Institute Second International Conference on Computer Integrated Manufacturing, Rensselaer Polytechnic Institute, USA, May 1990.
- Ohio State University Control Workshop, Columbus, USA, April 1990.

Professional

- Fellow Member of IEEE.
- Senior Editor, IEEE Transactions on ITS, 2016-.
- Associate Editor, IEEE Transactions on ITS, 2003-2015.
- Associate Editor, Transportation Research: Part C, 2006-2014.
- Associate Editor, Journal of Intelligent and Robotic Systems, 2006-2019.
- Honorary Chair, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2020).
- General Chair of the 2012 IEEE Robotics and Automation Conference.
- Vice President for Conferences, RAS, 2010-2013.
- Chair, Publication Ethics Committee, RAS, 2015-.
- Chair, Saridis and Service Awards Evaluation Committee, RAS, 2016-2018.
- ICRA-x Chair of the 2018 IEEE Robotics and Automation Conference.
- 2018, 2020, and 2022 IEEE CS Fellows Evaluation Committee.
- Program Co-Chair, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2018).
- Publicity Chair, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2017).
- Publications Chair, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2015).
- Publications Chair, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2014).
- Member, RAS Long-Range Planning Committee, 2014-2015.
- Editor, RAS Conference Editorial Board, 2006-2009.
- Editor, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2011), Conference Editorial Board, 2011.
- Member of the IEEE Robotics and Automation Administrative Committee, 2000-2005.
- Member, RAS IEEE Fellow Nomination Committee, 2013-2014.
- Chairman, RAS IEEE Fellow Nomination Committee, 2007-2008.
- Chairman of the IEEE Robotics and Automation Technical Committee on Robot Vision, 2000-2006.
- America Program Co-Chair of the 2009 IEEE/RSJ International Conference on Intelligent Robots and Systems.
- Awards Chair of the 2008 IEEE Robotics and Automation Conference.
- Program Chair of the 2006 IEEE Robotics and Automation Conference.
- America Program Co-Chair of the 2007 IEEE/RSJ International Conference on Intelligent Robots and Systems.
- America Program Co-Chair of the 2004 IEEE Robotics and Automation Conference.
- Vice-Chairman of the 2001 IEEE/RSJ International Conference on Intelligent Robots and Systems.
- Chief organizing member of the Hellenic Student Association of Carnegie Mellon University.
- Participation in National Science Foundation review panels for regular proposals.
- Reviewer of proposals for the Department of Energy and the National Science Foundation.
- Participation in an IEEE review panel for senior member candidates.
- Participation in the faculty recruitment committee, Department of Electrical and Computer Engineering, University of Cyprus.
- Reviewer of proposals for the Austrian Science Fund, Europian Union, the Portuguese Ministry of Science and Technology (FCT program), the Qatar National Research Fund, the National Centre of Science and Technology Evaluation of Kazakhstan, the Kroatia Science Foundation, and the Hong Kong Research Grants Council.
- Member of the Technical Chamber of Greece.
- Organizer of the ARO/NSF Workshop on Future Directions in Visual Navigation, Pasadena, CA, May 2008.
- Editor of a special issue on "Analysis and Experiments in Distributed Multi-Robot Systems" of the *Journal Autonomous Robots* (2004).
- Guest Editor of a special issue on "Panoramic Robotics" of the *Robotics and Automation Magazine* (2003).
- Guest Editor of a special issue on "Applied Visual Servoing" of the *Robotics and Automation Magazine* (December 1998).

- Guest Editor of a special issue on "Modelling Issues for Visual Sensing" of the Journal *Mathematical and Computer Modelling.*
- Program committee member for the 2021 and 2023 International Conferences on Unmanned Aircraft Systems (ICUAS).
- Program committee member for the 31st Mediterranean Conference on Control and Automation, June 2023.
- Program committee member for the 10th International Symposium on Distributed Autonomous Robotic Systems.
- Program committee member for the 13th International Conference on Computer Vision.
- Program committee member for the 2010, 2011, and 2012 IEEE Conferences on Computer Vision and Pattern Recognition.
- Program committee member for the 1999, 2000, 2002, 2003, 2004, 2008, 2009, and 2014 IEEE/RSJ International Conferences on Intelligent Robots and Systems.
- Program committee member for the 2000, 2001, 2002, 2003, and 2005 IEEE Robotics and Automation Conferences.
- Program committee member for the 5th International Symposium on Visual Computing, November 2009.
- Program committee member for the 17th and 20th Mediterranean Conferences on Control and Automation, June 2009 and July 2012.
- Program committee member for the 2009 IEEE Intelligent Vehicles Symposium, June 2009.
- Program committee member for the 2nd International Conference on Pervasive Technologies Related to Assistive Environments, June 2009.
- Program committee member for the 5th IEEE Conference on Advanced Video and Signal Based Surveillance, September 2008.
- Program committee member for the 10th, 11th, 12th and 15th Annual IEEE Conferences on Intelligent Transportation Systems, 2007, 2008, 2009, 2012, and 2013.
- Program committee member for the 3rd and 4th International Symposiums on Visual Computing, 2007 and 2008.
- Program committee member for the 32nd Annual Conference of the IEEE Industrial Electronics Society, November 2006.
- Program committee member for the 9th Annual IEEE Conference on Intelligent Transportation Systems, September 2006.
- Program committee member for the International Conference on Intelligent Systems and Computing: Theory and Applications, July 2006.
- Program committee member of the 8th Annual IEEE Conference on Intelligent Transportation Systems, August 2005.
- Program committee member of the 13th Mediterranean Conference on Control and Automation, 2005.
- Program committee member of the IASTED Int. Conference on Robotics and Applications (RA 2005), 2005.
- Program committee member of the 2005 IEEE-RAS International Conference on Humanoid Robots, 2005.
- Program committee member of the 23rd IASTED Int. Conference on Modeling, Identification, and Control (MIC 2004), 2004.
- Program committee member of the IEEE Intelligent Vehicles Symposium, 2004.
- Program committee member for the European Workshop on Service and Humanoid Robots (SERVICEROB-2001).
- Program committee member for the International Congress on Autonomous Intelligent Systems, February 2002.
- Program committee member for the 6th Int'l Symp. on Artificial Intelligence, Robotics, & Automation in Space, 2001.
- Program committee member for the 4th Annual IEEE Conference on Intelligent Transportation Systems, August 2001.
- Program committee member of the 3rd Annual IEEE Conference on Intelligent Transportation Systems (ITSC-2000).
- Program committee member of the ISR 2000.
- Publicity chairman and program committee member of the 1998 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS '98).

- Program committee member of the Third European Robotics, Intelligent Systems and Control Conf., 1998.
- Publicity chairman and program committee member of the 1997 IEEE Robotics and Automation Conference.
- Award Chairman for the IEEE Int. Joint Symposia on Intelligence and Systems, 1996.
- Local arrangements chairman of the 1996 IEEE Robotics and Automation Conference.
- Member of the program committee of the 1995 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS '95).
- Member of the program committee of the 1994 IEEE Robotics and Automation Conference.
- Organizer of an invited session at the 1994 IEEE Robotics and Automation Conference.
- Invited sessions/tutorials chairman of the 1995 Symposium on Intelligent Control.
- Chairman of three sessions at the 2001 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS '01).
- Chairman of one session at the 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2013, 2014, and 2015 IEEE Robotics and Automation Conferences.
- Chairman of one session at the 2000 IEEE International Symposium on Intelligent Control (ISIC 2000).
- Chairman of two sessions at the 11th Mediterranean Conference on Control and Automation (MED'03).
- Chairman of two sessions at the 1998 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS '98).
- Chairman of one session at the 1998 IEEE Robotics and Automation Conference.
- Chairman of two sessions at the 1997 IEEE Robotics and Automation Conference.
- Chairman of two sessions at the 1996 IEEE Robotics and Automation Conference.
- Chairman of a session at the *10th IEEE International Symposium on Intelligent Control*.
- Chairman of a session at the *3rd IEEE Mediterranean Symposium on New Directions in Control and Automation*.
- Chairman of a session at the 1995 IEEE Robotics and Automation Conference.
- Chairman of a session at the 1995 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS '95).
- Chairman of two sessions at the 1995 American Control Conference.
- Chairman of a session at the 1994 IEEE Robotics and Automation Conference.
- Chairman of a session at the 1994 IEEE Conference on Systems, Man, and Cybernetics.
- Chairman of two sessions at the 1994 IEEE Robotics and Automation Conference.
- Chairman of a session at the 1993 IEEE International Symposium on Intelligent Control.
- Chairman of a session at the 1993 American Control Conference.
- Chairman of a session at the 31st IEEE Conference on Decision and Control (31st CDC).
- Chairman of a session at the 1992 American Control Conference.
- Reviewer of the following journals:
  IEEE Transactions on Automatic Control
  IEEE Transactions on Intelligent Transportation Systems
  IEEE Transactions on Vehicular Technology
  IEEE Transactions on Mechatronics
  IEEE Transactions on Robotics and Automation
  IEEE Control Systems Magazine
  IEEE Robotics and Automation Magazine
  IEEE Transactions on Systems, Man, and Cybernetics
  IEEE Transactions on Control Systems Technology
  IEEE Transactions on Neural Networks
  International Journal of Computer Vision
  Journal of Intelligent Control and Systems
  Journal of Intelligent and Robotic Systems: Theory and Applications
  Automatica
  Mathematical and Computer Modelling
  IEE Proceedings in Vision, Image and Signal Processing
  International Journal of Robotics and Automation
  Journal of Robotic Systems
  Journal of Robotics and Autonomous Systems
  Optimal Control: Applications and Methods
  Image and Vision Computing

Computer Vision and Image Understanding
Autonomous Robots
Mechatronics.

- Reviewer for the 1990 through 2017 IEEE Conferences on Robotics and Automation.
- Reviewer for the 80th Annual TRB meeting, 2001.
- Reviewer for the IJCNN 2000.
- Reviewer for the ISR 2000.
- Reviewer for the 36th IEEE CDC, Kobe, Japan.
- Reviewer for the 1995, 1998, 1999, 2002, and 2003 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS '95, ’98, ’99, ’02, and ‘03).
- Reviewer for the 4th IEEE Mediterranean Symposium on New Directions in Control and Automation.
- Reviewer for the 1995 American Control Conference.
- Reviewer for the 1st IEEE Conference on Control Applications.
- Reviewer for the 34th IEEE CDC, New Orleans, USA.
- Reviewer for the 30th IEEE CDC, Brighton, United Kingdom.
- Reviewer for the HICSS-24, Hawaii.

Contributions to Departmental and University Service

Administrative Duties

- Director of the Minnesota Robotics Institute (MnRI).
- Director of the Center for Distributed Robotics and SECTTRA.
- Leader of the effort to attract state (MnDRIVE) and donor funding for Robotics. This has resulted into more than $26M for the UMN Robotics.
- Acting Director of Graduate Studies, MS in Robotics, Fall 2020-.
- Director of Undergraduate Studies and Honors representative, Fall 2010-Spring 2013.
- Chair of the Research Funding Committee, Fall 2007-.
- Director of Undergraduate Studies and Honors representative, 2000-2004.

Committee Work

- Chair, CSE RSAM MnDRIVE Advising and Planning Committee, 2013-2019.
- Member of the UMN Benefits Advisory Committee, 2019-Present.
- CSE MnDRIVE Hiring Committee, 2013-2019.
- UMN Faculty Consultative Committee, 2016-Present.
- Chair, Committee for the Recruitment of the CSE Director of Strategic Sponsored Research Activities, 2022-2023.
- Member of the University Distinguished McKnight University Professor Selection Committee, 2014-2016.
- CSE College Scholarship and Award Committee, 2012-2021.
- Campus Committee on Student Behavior (CCSB), 2006-2010.
- Chair, CSE Department Head Evaluation Committee, 2010.
- Member of the Advisory/SPC Committee, 2009-2010.
- Member of the CTS Director Search Committee, 2010.
- Member of the DTC Director Search Committee, 2008.
- Member of the Faculty Recruitment committee, 2007-2008.
- Member of the IT P&T committee (2007-2010).
- Mentoring Chair for Prof. R. Kuang and Prof. H. Park.
- Mentoring committee member for Profs. V. Isler, J. Sattar, L. Yarosh, and W. Schuler.

Personal

- American Citizen