

**Prof. Michael A. Gennert**  
Robotics Engineering Program  
Computer Science Department  
Electrical and Computer Engineering Department

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### Research Interests

Robotics, Computer Vision, Image Processing, Scientific Databases, Programming Languages.

### Education

**Sc.D. Electrical Engineering and Computer Science**  
**Massachusetts Institute of Technology, 1987**

Dissertation under Professors B.K.P. Horn and W.E.L. Grimson: "A Computational Framework for Understanding Problems in Stereo Vision".

**S.M. Electrical Engineering**

**S.B. Electrical Engineering**

**S.B. Computer Science**

**Massachusetts Institute of Technology, 1980**

M.S. Thesis under Professor N.R. Sandell: "Analysis of Optimal Control of a Four-Gimbal Inertial System".

### Experience

**Worcester Polytechnic Institute**

Worcester, Massachusetts

February 2012 – Present	Professor of Computer Science
	Professor of Electrical and Computer Engineering
August 2007 – June 2017	Director, Robotics Engineering Program
February 2007 – July 2007	Acting Director, Robotics Engineering Program
July 2003 – January 2011	Computer Science Department Head
July 1999 – February 2012	Associate Professor of Electrical and Computer Engineering
July 1993 – February 2012	Associate Professor of Computer Science
August 1987 – June 1993	Assistant Professor of Computer Science.

**University of Massachusetts Medical Center**

Worcester, Massachusetts

July 2001 – August 2002	Visiting Associate Professor
June 1990 – August 1992	Consultant.

**University of California**

Riverside, California

July 1994 – June 1995	Visiting Associate Professor of Electrical Engineering.
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**PAR Technology Corporation**

New Hartford, New York

July 1980 – August 1982	Senior Analyst and Project Manager.
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**State University of New York, College of Technology**

Utica, New York

September 1981 – December 1981 Adjunct Professor, Department of Arts and Sciences.

**Courses Taught at WPI**

Undergraduate:

CS 100X Introduction to Programming in Java / CS 1006 Object-Oriented Introduction to Programming: A98, E99, A99, A00, A01.

CS 1101 Introduction to Program Design: A05.

CS 1102 Accelerated Introduction to Program Design: A05, A06.

CS 1021 Introduction to Programming: A87, B87.

CS 1032 Modern Programming Concepts II: D89, D90, D91, C92, C93.

CS 2135 Programming Language Concepts: C94, A95, C96, A96, A97, C98, C99, C00.

CS 2022/MA 2201 Discrete Mathematics: C89, A90, A91, A92, A93, A02.

CS 4341 Artificial Intelligence: B87, B89, B91, B95, A96, D03.

RBE 1001 Introduction to Robotics: D11, D12, B12, C13, B13, C14, C15, D15, C16, D17.

Graduate:

CS 504 Analysis of Computations and Systems: S00.

CS 534 Artificial Intelligence: F88, F89, S91.

CS 525 Special Topics: Data Compression: S98.

CS 536 Programming Language Design: S01.

CS/ECE 545 Digital Image Processing: F93, F97, S00, F02, F09, F11.

RBE/CS 549 Computer Vision: F88, S90, S93, S97, S99, F01, F12, F14, F15, F16.

CS 590 Computer Science Seminar: F91.

In publications, undergraduate and graduate student co-authors are denoted by <sup>U</sup> and <sup>G</sup>, respectively.**Journal Articles**

- J1 H. Kimpara, K. Mbanisi<sup>G</sup>, J. Fu, Z. Li, D. Prokhorov, M.A. Gennert, “Human Model-based Active Driving System in Vehicular Dynamic Simulation”, submitted to *IEEE Trans. Intelligent Transportation Systems*, Sep. 2018.
- J2 M. DeDonato, F. Polido, K. Knoedler, B.P.W. Babu<sup>G</sup>, N. Banerjee<sup>G</sup>, D. Berenson, C.P. Bove<sup>U</sup>, X. Cui<sup>G</sup>, R. Du<sup>G</sup>, P. Franklin<sup>U</sup>, J.P. Graff<sup>U</sup>, P. He<sup>G</sup>, A. Jaeger<sup>U</sup>, L. Li<sup>G</sup>, M.A. Gennert, S. Feng<sup>G</sup>, F. Liu, X. Xinjilefu<sup>G</sup>, J. Kim<sup>G</sup>, C.G. Atkeson, X. Long<sup>G</sup>, T. Padir, “Team WPI-CMU: Achieving Reliable Humanoid Behavior in the DARPA Robotics Challenge”, *J. Field Robotics*, Vol. 34, No. 2, pp. 381-399, 2017.
- J3 T. Padir, M.A. Gennert, C.G. Atkeson. “Human Supervised Control of a Humanoid Robot for Non-Conventional Emergency Response”, *Mechanical Engineering*, Vol. 137, No. 6, pp. A17-21, June 2015.
- J4 M. DeDonato, V. Dimitrov<sup>G</sup>, R. Du<sup>G</sup>, R. Giovacchini<sup>G</sup>, K. Knoedler, X. Long<sup>G</sup>, F. Polido<sup>G</sup>, M.A. Gennert, T. Padir, S. Feng<sup>G</sup>, H. Moriguchi, E. Whitman, X. Xinjilefu<sup>G</sup>, C.G. Atkeson, “Human-in-the-Loop Control of a Humanoid Robot for Disaster Response: A Report from the DARPA Robotics Challenge Trials”, *J. Field Robotics*, Vol. 32, No. 2, pp. 275-292, March 2015.
- J5 T. Padir, G. Fischer, S. Chernova, M.A. Gennert, “A Unified and Integrated Approach to Teaching a Two-Course Sequence in Robotics Engineering”, *J. Robotics and Mechatronics*, Vol. 23, No. 5, 2011.
- J6 T. Padir, M.A. Gennert, G. Fischer, W.R. Michalson, E.C. Cobb, “Implementation of an Undergraduate Robotics Engineering Curriculum”, *Computers in Education Journal* special issue on Robotics Education, Vol. 1, No. 3, pp. 92-101, July-September 2010.

- J7 S. Gu<sup>G</sup>, J.E. McNamara, J. Mitra, H. Gifford, K. Johnson, M.A. Gennert, M.A. King, “Body Deformation Correction for SPECT Imaging”, *IEEE Trans. Nuclear Science*, Vol. 57, No. 1, pp. 214–224, February 2010.
- J8 M.A. Gennert, G. Tryggvason, “Robotics Engineering: A Discipline Whose Time Has Come”, *IEEE Robotics & Automation Magazine*, pp. 18–20, June 2009.
- J9 J.E. McNamara, P.H. Pretorius, K. Johnson, J.M. Mukherjee, J. Dey, M.A. Gennert, M.A. King, “A flexible multicamera visual-tracking system for detecting and correcting motion-induced artifacts in cardiac SPECT slices”, *Medical Physics*, Vol. 36, No. 5, pp. 1913–1923, May 2009.
- J10 J.E. McNamara, P.P. Bruyant, K. Johnson, B. Feng, A. Lehovich, S. Gu<sup>G</sup>, M.A. Gennert, M.A. King, “An Assessment of a Low-Cost Visual Tracking System (VTS) to Detect and Compensate for Patient Motion During SPECT”, *IEEE Trans. Nuclear Science*, Vol. 55, No. 3, Part 1, pp. 992–998, June 2008.
- J11 R.D. Beach, H. Depold, G. Boening, P.P. Bruyant, B. Feng, H.C. Gifford, M.A. Gennert, S. Nadella<sup>G</sup>, and M.A. King, “An Adaptive Approach to Decomposing Patient-Motion Tracking Data Acquired During Cardiac SPECT Imaging”, *IEEE Trans. Nuclear Science*, Vol. 54, No. 1, pp. 130–139, Feb. 2007.
- J12 B. Feng, P.P. Bruyant, P.H. Pretorius, R.D. Beach, H.C. Gifford, J. Dey, M. Gennert, M.A. King, “Estimation of the Rigid-Body Motion from Three-Dimensional Images Using a Generalized Center-of-Mass Points Approach”, *IEEE Trans. Nuclear Science*, Vol. 53, No. 5, Part 1, pp. 2712–2718, Oct. 2006.
- J13 B. Feng, H.C. Gifford, R.D. Beach, G. Boening, M.A. Gennert, M.A. King, “Use of the Three-Dimensional Gaussian Interpolation in the Projector / Backprojector Pair of Iterative Reconstruction for Compensation of Known Rigid-Body Motion in SPECT”, *IEEE Trans. Medical Imaging*, Vol. 25, No. 7, pp. 838–844, July 2006.
- J14 P.P. Bruyant, M.A. Gennert, G.C. Speckert, R.D. Beach, J.D. Morgenstern<sup>G</sup>, N. Kumar<sup>G</sup>, S. Nadella<sup>G</sup>, M.A. King, “A Robust Visual Tracking System for Motion Detection in SPECT: Hardware Solutions”, *IEEE Trans. Nuclear Science*, Volume 52, Issue 5, Part 1, pp. 1288–1294, Oct. 2005.
- J15 R.D. Beach, P.H. Pretorius, G. Boening, P.P. Bruyant, B. Feng, R.R. Fulton, M.A. Gennert, S. Nadella<sup>G</sup>, and M.A. King, “Feasibility of Stereo-Infrared Tracking to Monitor Patient Motion During Cardiac SPECT Imaging”, *IEEE Trans. Nuclear Science*, Vol. 51, No. 5, pp. 2693–2698, Oct. 2004.
- J16 T.H. Farncombe, H.C. Gifford, M.V. Narayanan, P.H. Pretorius, P. Bruyant, M. Gennert, and M.A. King, “An Optimization of Reconstruction Parameters and Investigation Into the Impact of Photon Scatter in <sup>67</sup>Ga SPECT”, *IEEE Trans. Nuclear Science*, Vol. 49, No. 5, pp. 2147–2154, Oct. 2002.
- J17 M.A. Gennert, G.L. Leatherman, and N. Wittels, “Uniform Frontal Illumination of Planar Surfaces: Where to Place the Lamps”, *Optical Engineering*, pp. 1261–1271, June 1993.
- J18 T. El-Korchi, M.A. Gennert, M.O. Ward, and N. Wittels, “Lighting Design for Automated Pavement Surface Distress Evaluation”, *Transportation Res. Rec.*, No. 1311, pp. 144–148, 1991.
- J19 J. Leblanc<sup>G</sup>, M.A. Gennert, N. Wittels, and D. Gosselin<sup>G</sup>, “Analysis and Generation of Pavement Distress Images Using Fractals”, *Transportation Res. Rec.*, No. 1311, pp. 158–165, 1991.
- J20 D.T. Long, M.A. King, and M.A. Gennert, “Development of a 3D Gradient-Based Method for Volume Quantitation in SPECT”, *IEEE Trans. Nuclear Science*, Vol. 38, No. 2, pp. 748–754, Apr. 1991.

## Conference Proceedings

- C1 V. Jagtap<sup>G</sup>, S. Agarwal<sup>G</sup>, S.N. Gavarraju<sup>G</sup>, S. Kejriwal<sup>G</sup>, M.A. Gennert, “Extended State Machines for Robust Robot Performance in Complex Tasks”, accepted to IEEE RAS Int. Conf. on Humanoid Robots (Humanoids 2018), Nov. 2018.

- C2 K.C. Mbanisi<sup>G</sup>, H. Kimpara, T.B. Meier<sup>U</sup>, M.A. Gennert, Z. Li, “Learning Coordinated Vehicle Maneuver Motion Primitives from Human Demonstration”, accepted to IEEE/RSJ Int. Conf. on Intelligent Robots and System (IROS), Oct. 2018.
- C3 H. Kimpara, K.C. Mbanisi<sup>G</sup>, J. Fu, Z. Li, K.L. Troy, M.A. Gennert, “Balancing Human Driver Posture in Vehicle Under Lateral Motion”, ASB 2018 Annual Conf. American Society of Biomechanics, Rochester, MN, Aug. 2018.
- C4 R. Natarajan<sup>G</sup>, M.A. Gennert, “Efficient Factor Graph Fusion for Multi-Robot Mapping and Beyond”, IEEE Int. Conf. Information Fusion (FUSION) July 2018.
- C5 K.C. Mbanisi<sup>G</sup>, H. Kimpara, Z. Li, M.A. Gennert, T.B. Meier<sup>U</sup>, “Learning Movement Primitives for Driving Tasks from Human Demonstration”, 8th World Congress of Biomechanics, Dublin, July 2018.
- C6 M.A. Gennert, C.B. Putnam, “Robotics Engineering as an Undergraduate Major: 10 Years’ Experience”, ASEE Annual Meeting, Salt Lake City, UT, Jun. 2018.
- C7 V. Jagtap<sup>G</sup>, S.N. Gavarraju<sup>G</sup>, S. Agarwal<sup>G</sup>, S. Kejriwal<sup>G</sup>, S. Devadoss<sup>G</sup>, M.A. Gennert, “Towards Full Autonomy for Humanoid Robots”, IEEE/RSJ Int. Conf. on Intelligent Robots and System (IROS), Sep. 2017.
- C8 R. Natarajan<sup>G</sup>, M.A. Gennert, “Efficient Factor Graph Fusion for Multi-Robot Mapping”, IEEE/RSJ Int. Conf. on Intelligent Robots and System (IROS), Sep. 2017.
- C9 C. Lindsay, A. Bhat<sup>G</sup>, M.A. King, M.A. Gennert, “A Novel Robotic Motion Phantom For Ground Truth Motion in Medical Imaging”, 6th Int. Wkshp. on Computational Human Phantoms, Aug. 2017.
- C10 S.H. Roy, B. Shiwani<sup>G</sup>, J.C. Kline, M.H. Saint-Hilaire, C.A. Thomas, M.A. Gennert, G. De Luc, “Real-Time, Autonomous Tracking of Whole-Body Bradykinesia In Parkinson’s Disease”, ASB 2017 Annual Conf. American Society of Biomechanics, Aug. 2017.
- C11 L. Li<sup>G</sup>, X. Long<sup>G</sup>, M.A. Gennert, “BiRRTOpt: A Combined Sampling and Optimizing Motion Planner for Humanoid Robots”, Humanoids 2016, Nov. 2016.
- C12 V. Dimitrov<sup>G</sup>, V. Jagtap<sup>G</sup>, J. Skorinko, S. Chernova, M. Gennert, and T. Padir, “Human-Centered Design of a Cyber-Physical System for Advanced Response to Ebola (CARE)”, 37th Annual Int. Conf. IEEE Engineering in Medicine and Biology Society (EMBC), pp. 6856-6859, 2015.
- C13 C.G. Atkeson, N. Banerjee<sup>G</sup>, D. Berenson, M. DeDonato, R. Du<sup>G</sup>, S. Feng<sup>G</sup>, J. Kim, K. Knoedler, C. Liu, X. Long<sup>G</sup>, F. Polido, M.A. Gennert, T. Padir, X. Xinjilefu<sup>G</sup>, B.P.W. Babu<sup>G</sup>, C. Bove<sup>U</sup>, J. Graff<sup>U</sup>, P. He<sup>G</sup>, A. Jaeger<sup>U</sup>, L. Li<sup>G</sup>, “NO FALLS, NO RESETS: Reliable Humanoid Behavior in the DARPA Robotics Challenge”, Humanoids 2015, Nov. 2015.
- C14 N. Banerjee<sup>G</sup>, X. Long<sup>G</sup>, R. Du<sup>G</sup>, F. Polido, S. Feng<sup>G</sup>, C.G. Atkeson, M.A. Gennert, T. Padir, “Human-Supervised Control of the ATLAS Humanoid Robot for Traversing Doors”, Humanoids 2015, Nov. 2015.
- C15 K. Knoedler, V. Dimitrov<sup>G</sup>, D. Conn, M.A. Gennert, T. Padir, “Towards Supervisory Control of Humanoid Robots for Driving Vehicles during Disaster Response Missions”, IEEE Int. Conf. Technologies for Practical Robot Applications, pp. 1-6, May 2015.
- C16 M.A. Gennert, T. Padir, “Robotics Engineering as an Undergraduate Major: A 5 year Retrospective”, ASEE Annual Meeting, Atlanta, GA, Jun. 2013.
- C17 J.M. Barrett<sup>G</sup>, M.A. Gennert, W.R. Michalson, M.D. Audi, J.L. Center Jr., J.F. Kirk, “Development of a Low-Cost, Self-Contained Combined Vision and Inertial Navigation System”, IEEE Int. Conf. Technologies for Practical Robot Applications, Apr. 2013.

- C18 C. Lindsay, M.A. Gennert, A. Konik, P. K. Dasari<sup>G</sup>, M.A. King, “Automatic Generation of Digital Anthropomorphic Phantoms from Simulated MRI Acquisitions”, SPIE Medical Imaging Conf., Lake Buena Vista, FL, Feb. 2013.
- C19 B.P.W. Babu<sup>G</sup>, E.T. Read<sup>U</sup>, J.A. Gostanian<sup>U</sup>, M.A. Gennert, “A tree-climbing robot for invasive insect detection”, Int. Conf. on Climbing and Walking Robots, Jul. 2012.
- C20 T. Padir, M.A. Gennert, F.J. Looft, “Assessing Multidisciplinary Design in a Robotics Engineering Curriculum”, ASEE Annual Meeting, San Antonio, TX, Jun. 2012.
- C21 J.M. Barrett<sup>G</sup>, M.A. Gennert, W.R. Michalson, J.L. Center, “Analyzing and modeling an IMU for use in a low-cost combined vision and inertial navigation system”, IEEE Int. Conf. Technologies for Practical Robot Applications, pp. 19–24, Apr. 2012.
- C22 C. Lindsay, M.A. Gennert, C.M. Connolly, A. Konik, P. Dasari<sup>G</sup>, W.P. Segars, M.A. King, “Interactive generation of digital anthropomorphic phantoms from XCAT shape priors”, SPIE Biomedical Applications in Molecular, Structural, and Functional Imaging Conf., San Diego, CA, Feb. 2012.
- C23 M.A. Gennert, W.R. Michalson, M.A. Demetriou, “A Robotics Engineering M.S. Degree”, ASEE Annual Meeting, Louisville, KY, Jun. 2010.
- C24 G. Tryggvason, M.A. Gennert, F.J. Looft, T. Padir, L.E. Schachterle, “Robotics Engineering: Assessing an Interdisciplinary Program”, ASEE Annual Meeting, Louisville, KY, Jun. 2010.
- C25 R.D. Beach, M.A. Gennert, W.R. Michalson, J. van de Ven, T. Padir, G. Tryggvason, G.S. Fischer, “Robotics Innovations Competition and Conference (RICC): Building Community Between Academia and Industry Through a University-Level Student Competition”, ASEE Annual Meeting, Louisville, KY, Jun. 2010.
- C26 J. Skorinko, J. Lay, G. McDonald, B. Miller, C. Shaver, C. Randall, J. Doyle, M. Gennert, J. van de Ven, “The Social Outcomes of Participating in the FIRST Robotics Competition Community”, ASEE Northeast Section Conf., May 2010.
- C27 S. Gu<sup>G</sup>, J.E. McNamara, J. Mitra, H.C. Gifford, A.V. Sklyar<sup>G</sup>, K. Johnson, M.A. Gennert, M.A. King, “Improved Motion Correction in SPECT Imaging Using a Non-rigid Motion Model”, IEEE Nuclear Science Symp. and Medical Imaging Conf., Orlando, pp. 3242–3246, Oct. 2009.
- C28 A.V. Sklyar<sup>G</sup>, S. Gu<sup>G</sup>, M.A. Gennert, M.A. King, “Generating anthropomorphic phantoms semi-automatically from magnetic resonance images”, IEEE Nuclear Science Symp. and Medical Imaging Conf., Orlando, pp. 2743–2746, Oct. 2009.
- C29 M.J. Ciaraldi, E.C. Cobb, D. Cyganski, M.A. Demetriou, G. Fischer, M.A. Gennert, F.J. Looft, W.R. Michalson, B.A. Miller, Y. Rong, K. Stafford, G. Tryggvason, J.D. Van de Ven, “Robotics Engineering: A New Discipline for a New Century”, ASEE Annual Meeting, Austin, TX, Jun. 2009.
- C30 S. Gu<sup>G</sup>, C. Lindsay<sup>G</sup>, M.A. Gennert, M.A. King, “A Quick 3D-to-2D Points Matching based on the Perspective Projection”, Int. Symp. Visual Computing, Las Vegas, Dec. 2008.
- C31 S. Gu<sup>G</sup>, J.E. McNamara, K. Johnson, H. Gifford, A.V. Sklyar<sup>G</sup>, M.A. Gennert, M.A. King, “Pattern independent deformation estimation illustrated by MRI”, IEEE Nuclear Science Symp. and Medical Imaging Conf., Dresden, Germany, pp. 5285–5291, Oct. 2008.
- C32 J.E. McNamara, K. Johnson, J. Mitra, H.P. Pretorius, S. Gu<sup>G</sup>, M.A. Gennert, M.A. King, “Correction of motion-induced artifacts in clinical cardiac SPECT studies using a stereo-motion-tracking system” IEEE Nuclear Science Symp. and Medical Imaging Conf., Dresden, Germany, pp. 4319–4323, 2008.
- C33 M.J. Ciaraldi, E.C. Cobb, D. Cyganski, M.A. Gennert, M.A. Demetriou, F.J. Looft, W.R. Michalson, B.A. Miller, Y. Rong, L.E. Schachterle, K. Stafford, G. Tryggvason, J.D. Van de Ven, “The New Robotics Engineering BS Program at WPI”, ASEE Annual Meeting, Pittsburgh, PA, Jun. 2008.

- C34 S. Gu<sup>G</sup>, J.E. McNamara, H. Gifford, M.A. Gennert, M.A. King, “Body Deformation Correction for SPECT Tomography”, IEEE Nuclear Science Symp. and Medical Imaging Conf., Washington, DC, pp. 2708–2714, Oct. 2007.
- C35 J.E. McNamara, B. Feng, K. Johnson, S. Gu<sup>G</sup>, M.A. Gennert, M.A. King, “Motion Capture of Chest and Abdominal Markers Using a Flexible Multi-Camera Motion-Tracking System for Correcting Motion-Induced Artifacts in Cardiac SPECT”, IEEE Nuclear Science Symp. and Medical Imaging Conf., Washington, DC, pp. 4289–4293, Oct. 2007.
- C36 J.E. McNamara, M.A. King, B. Feng, K. Johnson, M.A. Gennert, “Spatial and temporal accuracy of a flexible multi-camera motion-tracking system for motion correction of cardiac SPECT”, Proc. Society Nuclear Medicine 54th Annual Meeting, Washington, DC, June 2007.
- C37 S. Gu<sup>G</sup>, J.E. McNamara, K. Johnson, M.A. Gennert, M.A. King, “Calibration Accuracy Evaluation with Stereo Reconstruction”, Int. Conf. Image and Graphics, Chengdu, China, pp. 7–12, 2007.
- C38 S. Gu<sup>G</sup>, J. McNamara, M.O. Ward, M.A. Gennert, M. A. King, “Calibration Accuracy Evaluation for Stereo Reconstruction”, IEEE Nuclear Science Symp. and Medical Imaging Conf., San Diego, pp. 3242–3246, Oct. 2006.
- C39 J.E. McNamara, P.P. Bruyant, K. Johnson, B. Feng, A. Lehovich, S. Gu<sup>G</sup>, M.A. Gennert, M.A. King, “An Assessment of a Visual Tracking System (VTS) to Detect and Compensate for Patient Motion During SPECT”, IEEE Nuclear Science Symp. and Medical Imaging Conf., San Diego, pp. 3235–3238, Oct. 2006.
- C40 R.D. Beach, H.C. Gifford, P.P. Bruyant, B. Feng, M.A. Gennert, S. Nadella<sup>G</sup>, M.A. King, “Stereo-Infrared Tracking to Monitor and Characterize Rigid-Body Motion and Respiration During Cardiac SPECT Imaging: Progress Towards Robust Clinical Utilization”, IEEE Nuclear Science Symp. and Medical Imaging Conf., San Juan, PR, Oct. 2005.
- C41 P.P. Bruyant, M.A. Gennert, S. Nadella<sup>G</sup>, M.A. King, “The Visual Tracking System (VTS) for Patient Motion Detection in SPECT: Quality Control of the Stereo Calibration”, IEEE Nuclear Science Symp. and Medical Imaging Conf., San Juan, PR, Oct. 2005.
- C42 L. Ma<sup>G</sup>, S. Gu<sup>G</sup>, S. Nadella<sup>G</sup>, P.P. Bruyant, M.A. King, M.A. Gennert, “A practical rebinning-based method for patient motion in SPECT imaging”, Int. Conf. Computer Graphics, Imaging Visualization (CGIV 2005), pp. 209–214, Beijing, China, July 2005.
- C43 R.D. Beach, H. Depold, G. Boening, P. Bruyant, B. Feng, H. Gifford, M. Gennert, S. Nadella<sup>G</sup>, M. King, “An Adaptive Neural Network Approach to Decomposition of Patient Stereo-Infrared Tracking Motion Data During Cardiac SPECT Imaging Using Asymmetric Median Filters”, IEEE Nuc. Sci. Symp. Med. Im. Conf., Rome, pp. 4146–4150, 2004.
- C44 J.D. Morgenstern<sup>G</sup>, M.A. Gennert, N. Kumar<sup>G</sup>, S. Nadella<sup>G</sup>, G.C. Speckert, P.P. Bruyant, M.A. King, “A Real-time Multi-threaded System to Detect Motion in SPECT Imaging Using Multiple Optical Cameras”, IEEE Nuc. Sci. Symp. Med. Im. Conf., Rome, pp. 2923–2925, 2004.
- C45 P.P. Bruyant, M.A. Gennert, G.C. Speckert, R.D. Beach, J.D. Morgenstern<sup>G</sup>, N. Kumar<sup>G</sup>, S. Nadella<sup>G</sup>, M.A. King, “A Robust Visual Tracking System for Motion Detection in SPECT: Improved Design and Validation Against the Polaris Infra-Red Tracking System”, IEEE Nuc. Sci. Symp. Med. Im. Conf., Rome, pp. 3094–3097, 2004.
- C46 P.P. Bruyant, M.A. Gennert, G.C. Speckert, R.D. Beach, G. Boening, J. Morgenstern<sup>G</sup>, N. Arora<sup>G</sup>, S. Nadella<sup>G</sup>, M.A. King, “New Design for a Visual Tracking System to Detect Patient Motion in SPECT”, Soc. Nuclear Medicine 48th Annual Meeting, Philadelphia, PA, 2004.

- C47 M.A. Gennert, J.K. Ho<sup>U</sup>, A.C. Quina<sup>U</sup>, J.H. Wang<sup>U</sup>, P.P. Bruyant, and M.A. King, “Feasibility of Tracking Patient Respiration During Cardiac SPECT Imaging Using Stereo Optical Cameras”, IEEE Nuc. Sci. Symp. Med. Im. Conf., Portland, OR, Oct. 2003.
- C48 M.A. Gennert, P.P. Bruyant, M.V. Narayanan, and M.A. King, “Assessing a System to Detect Patient Motion in SPECT Imaging Using Stereo Optical Cameras”, Conf. Record IEEE Nuc. Sci. Symp. Med. Im. Conf., Norfolk, VA, Nov. 2002.
- C49 T.H. Farncombe, H.C. Gifford, M.V. Narayanan, P.H. Pretorius, P. Bruyant, M. Gennert, and M.A. King, “An Investigation into the Impact of Photon Scatter in the Detection of <sup>67</sup>Ga Tumours Using Channelized Hotelling and Human Observers”, Proc. IEEE Nuc. Sci. Symp. Med. Im. Conf., pp. 2214–2218, San Diego, CA, Nov. 2001.
- C50 D.A. Lisin<sup>G</sup> and M.A. Gennert, “Optimal Function Approximation Using Fuzzy Rules”, Proc. Int. Conf. North American Fuzzy Information Processing Society, pp. 184–188, NY, NY, June 1999.
- C51 N. Wittels and M.A. Gennert, “Optimal Lighting Design to Maximize Illumination Uniformity”, Proc. SPIE Symp. Imaging and Illumination for Metrology and Inspection, Vol. 2348, Boston, MA, Nov. 1994.
- C52 N. Wittels, T. El-Korchi, Y. Li<sup>G</sup>, and M.A. Gennert, “Detecting and Characterizing Small Voids in Mostly-Diffuse Materials”, Proc. SPIE Symp. Imaging and Illumination for Metrology and Inspection, Vol. 2348, Boston, MA, Nov. 1994.
- C53 M.A. Gennert, N.I. Hachem, N. Serrao<sup>G</sup>, and A. Bansal<sup>G</sup>, “Distributing Computations Among GIS Servers”, Proc. 7<sup>th</sup> Int. Conf. Parallel and Distributed Computing Systems, pp. 294–301, Las Vegas, NV, Oct. 1994.
- C54 C.E. Wills, D. Finkel, M.A. Gennert, and M.O. Ward, “Peer Learning in an Introductory Computer Science Course”, Proc. SIG Computer Science Education, Phoenix, AZ, Mar. 1994.
- C55 N.I. Hachem, M.A. Gennert, and N. Wittels, “Machine Vision Detection of the High Points on Small, Curved, Shiny Things”, Proc. SPIE Symp. Optics, Illumination, and Image Sensing for Machine Vision VIII, Vol. 2065, pp. 24–33, Boston, MA, Sept. 1993.
- C56 M.A. Gennert and N. Wittels, “Uniform Frontal Illumination of Planar Surfaces: Criteria for Optimal Lighting Design”, Proc. SPIE Symp. Optics, Illumination, and Image Sensing for Machine Vision VIII, Vol. 2065, pp. 62–69, Boston, MA, Sept. 1993.
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## Workshop Proceedings

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- W4 M.J. Ciaraldi, D. Cyganski, M.A. Demetriou, M.A. Gennert, B.A. Miller, Y.K. Rong, L.E. Schachterle, K.A. Stafford, G. Tryggvason, “A Robotics Engineering Major”, Proc. Wkshp. on Research in Robots for Education, Atlanta, GA, June 2007.
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- W6 M.A. Gennert, N.I. Hachem, and A. Bansal<sup>G</sup>, “Distributed Retrieval, Computation, and Storage of GIS Data”, Proc. 2<sup>nd</sup> ACM Wkshp. Advances in Geographic Information Systems, pp. 160–165, Gaithersburg, MD, Dec. 1994.
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- W11 N.I. Hachem, M.A. Gennert, and M.O. Ward, “The Gaea System: A Spatio-Temporal Database System for Global Change Studies”, Proc. AAAS Wkshp. on Advances in Data Management for the Scientist and Engineer, pp. 84–89, Boston, MA, Feb. 1993.
- W12 T. El-Korchi, M.A. Gennert, M.O. Ward, and N. Wittels, “An Engineering Approach to Automated Pavement Surface Distress Evaluation”, Proc. Automated Pavement Distress Data Collection Equipment Seminar, pp. 165–174, Iowa State University, Ames, Iowa, June 1990.
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## Book Chapters

- BC1 C. G. Atkeson, B. P. W. Babu<sup>G</sup>, N. Banerjee<sup>G</sup>, D. Berenson, C. P. Bove<sup>U</sup>, X. Cui<sup>G</sup>, M. DeDonato, R. Du<sup>G</sup>, S. Feng<sup>G</sup>, P. Franklin<sup>U</sup>, M. Gennert, J. P. Gray, P. Hey, A. Jaeger<sup>U</sup>, J. Kim, K. Knoedler, L. Li<sup>G</sup>, C. Liu<sup>G</sup>, X. Long<sup>G</sup>, T. Padir, F. Polido, G. G. Tighe<sup>U</sup>, X. Xinjilefu<sup>G</sup>, “What Happened at the DARPA Robotics Challenge Finals”, in *The Darpa Robotics Challenge Finals: Humanoid Robots To The Rescue*, Springer International Publishing AG, 2018.
- BC2 B. Shiwani<sup>G</sup>, S. Roy, J. Kline, M. Saint-Hilaire, C. Thomas, M. Gennert, G. De Luca, “Improved detection of gait abnormalities in Parkinson’s disease using an IMU sensor-based system”, in *Movement Disorders*, Vol. 32, Wiley, 2017.
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- BC4 M.A. Gennert and G. Tryggvason, “A New Discipline for a New Century: Robotics Engineering”, Chapter 10 in D. Apelian and G. Tryggvason, in *Shaping Our World: Engineering Education for the 21<sup>st</sup> Century*, Wiley, 2011.
- BC5 M. Ali<sup>G</sup>, M.A. Gennert, and T.G. Clarkson, “Analysis, Generation and Compression of Pavement Distress Images Using Fractals”, Chapter 9 in *Applications of Fractals and Chaos*, A.J. Crilly, R.A. Earnshaw, and H. Jones (eds.), pp. 147–170, Springer-Verlag, 1993.

## Posters

- P1 M.A. Gennert, G. Tryggvason, “Educating the Global Robotics Engineer”, ASEE International Forum, ASEE Annual Meeting, Atlanta, GA, Jun. 2013.
- P2 J. Skorinko, J. Doyle, G. Tryggvason, M.A. Gennert, M. “Do goals matter in engineering education? An exploration of how goals influence outcomes for FIRST robotics participants”, Poster presented at the NSF Engineering Education Awardees Conf., Washington, DC, Mar. 2012.
- P3 S. Gu<sup>G</sup>, J.E. McNamara, J. Mitra, H.C. Gifford, A.V. Sklyar<sup>G</sup>, K. Johnson, M.A. Gennert, M.A. King, “Improved Motion Correction in SPECT Imaging Using a Non-rigid Motion Model”, IEEE Nuclear Science Symp. and Medical Imaging Conf., Orlando, Oct. 2009.
- P4 A.V. Sklyar<sup>G</sup>, S. Gu<sup>G</sup>, M.A. Gennert, M.A. King, “Generating Anthropomorphic Phantoms Semi-Automatically from Magnetic Resonance Images”, IEEE Nuclear Science Symp. and Medical Imaging Conf., Orlando, Oct. 2009.
- P5 J.E. McNamara, K. Johnson, J. Mitra, S. Gu<sup>G</sup>, M.A. Gennert, M.A. King, P.H. Pretorius, “Correction of Motion-Induced Artifacts in Clinical Cardiac SPECT Studies Using a Stereo-Motion-Tracking System”, IEEE Nuclear Science Symp. and Medical Imaging Conf., Dresden, Oct. 2008.
- P6 S. Gu<sup>G</sup>, J.E. McNamara, K. Johnson, H.C. Gifford, A.V. Sklyar<sup>G</sup>, M.A. Gennert, M.A. King, “Pattern Independent Deformation Estimation Illustrated by MRI”, IEEE Nuclear Science Symp. and Medical Imaging Conf., Dresden, Oct. 2008.
- P7 M.A. Gennert “Robotics Innovations Competition and Conference”, NSF CPATH PI Workshop, Arlington, VA, November 2008.
- P8 S. Gu<sup>G</sup>, M.A. Gennert, M.A. King, “Body Deformation Correction for SPECT Tomography”, IEEE Nuclear Science Symp. and Medical Imaging Conf., Honolulu, Oct. 2007.

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- P10 S. Gu<sup>G</sup>, J. McNamara, M. Ward, M.A. Gennert, M. A. King, “Error Evaluation for Camera Calibration”, IEEE Nuclear Science Symp. and Medical Imaging Conf., San Diego, Oct. 2006.
- P11 J.E. McNamara, P.P. Bruyant, B. Feng, A. Lehovich, J. Dey, R.D. Beach, M. Gennert, M.A. King, “An Assessment of a Visual Tracking System (VTS) to Detect and Compensate for Patient Motion During SPECT: Calibration, Stability and Initial Results”, IEEE Nuclear Science Symp. and Medical Imaging Conf., San Diego, Oct. 2006.
- P12 L. Ma<sup>G</sup>, B. Feng, J. McNamara, M.A. Gennert, M.A. King, “Splitting Frames Based on Hypothesis Testing for Patient Motion Compensation in SPECT”, IEEE Nuclear Science Symp. and Medical Imaging Conf., San Diego, Oct. 2006.
- P13 B. Feng, P.P. Bruyant, P.H. Pretorius, R.D. Beach, H.C. Gifford, J. Dey, M. Gennert, M.A. King, “Estimation of the Rigid-Body Motion from Three-Dimensional Images Using a Generalized Center-of-Mass Points Approach”, IEEE Nuclear Science Symp. and Medical Imaging Conf., San Juan, PR, Oct. 2005.
- P14 B. Feng, H.C. Gifford, R.D. Beach, G. Boening, M.A. Gennert, M.A. King, “Use of the three-dimensional Gaussian interpolation in the projector / backprojector pair for compensation of the known rigid-body motion in SPECT”, Fully Three-Dimensional Image Reconstruction Meeting on Radiology and Nuclear Medicine, Salt Lake City, July, 2005.
- P15 P.P. Bruyant, M.A. Gennert, S. Nadella<sup>G</sup>, J.D. Morgenstern<sup>G</sup>, M.A. King, “Testing a Stereo Tracking System Using Virtual Reality”, Soc. Nuclear Medicine 52nd Annual Meeting, Toronto, Canada, June 2005.
- P16 R. Beach, M.A. King, P.P. Bruyant, R. Fulton, and M.A. Gennert, “Feasibility of Stereo-Infrared Tracking to Monitor Patient Motion During Cardiac SPECT Imaging”, IEEE Nuc. Sci. Symp. Med. Im. Conf., Portland, OR, Oct. 2003.
- P17 M.A. Gennert, P.P. Bruyant, M.V. Narayanan, and M.A. King, “Design of a System to Detect Patient Motion in SPECT Imaging Using Stereo Optical Cameras”, IEEE Nuc. Sci. Symp. Med. Im. Conf., Norfolk, VA, Nov. 2002.
- P18 M.A. Gennert, P.P. Bruyant, M.V. Narayanan, and M.A. King, “Detecting Patient Motion in SPECT Imaging Using Stereo Optical Cameras”, Soc. Nuclear Medicine 47th Ann. Mtg., Los Angeles, CA, June 2002.
- P19 M.A. Gennert, P.P. Bruyant, M.V. Narayanan, and M.A. King, “Calibrating Optical Images and Gamma Camera Images for Motion Detection”, Soc. Nuclear Medicine 47th Ann. Mtg., Los Angeles, CA, June 2002.

## Technical Reports

- T1 D. Finkel, M.L. Claypool, M.A. Gennert, F. Bianchi, D. O’Donnell, and P. Quinn, “Teaching Game Development: At the Intersection of Computer Science and Humanities & Arts”, Technical Report WPI-CS-TR-04-23, Computer Science Department, Worcester Polytechnic Institute, Nov. 2004.
- T2 D.A. Lisin<sup>G</sup> and M.A. Gennert, “Optimal Function Approximation Using Fuzzy Rules”, WPI-CS-TR-98-11, Computer Science Dept., WPI, Worcester, MA, Jan. 1999.
- T3 N.I. Hachem, N. Serrao<sup>G</sup>, M.A. Gennert, and K. Qiu<sup>G</sup>, “Derivation Nets: A Petri Net Model for the Management of Data Derivations in Scientific Experiments”, WPI-CS-TR-94-3, Computer Science Dept., WPI, Worcester, MA, Aug. 1994.

- T4 J.A. Choate<sup>G</sup> and M.A. Gennert, “Multiscale Relaxation Labeling of Fractal Images”, WPI-CS-TR-93-02, Computer Science Dept., WPI, Worcester, MA, 1993.
- T5 Y.H. Zhang<sup>G</sup>, M.O. Ward, N.I. Hachem, and M.A. Gennert, “A Visual Programming Environment for Supporting Scientific Data Analysis”, WPI-CS-TR-93-01, Computer Science Dept., WPI, Worcester, MA, 1993.
- T6 N.I. Hachem, K. Qiu<sup>G</sup>, M.A. Gennert, and M.O. Ward, “Managing Derived Data in the Gaea Scientific DBMS”, WPI-CS-TR-92-08, Computer Science Dept., WPI, Worcester, MA, 1992.
- T7 R.J. Wood<sup>G</sup> and M.A. Gennert, “A Hybrid Neural Network that uses a Hebbian/Backpropagation Learning Rule”, WPI-CS-TR-92-04, Computer Science Dept., WPI, Worcester, MA, 1992.
- T8 K. Qiu<sup>G</sup>, N.I. Hachem, M.O. Ward, and M.A. Gennert “Providing Temporal Support in Data Base Management Systems for Global Change Research”, WPI-CS-TR-92-03, Computer Science Dept., WPI, Worcester, MA, 1992.
- T9 M.A. Gennert and S. Negahdaripour, “Relaxing the Brightness Constancy Constraint in Optical Flow”, MIT AI Memo 975, June 1987.
- T10 M.A. Gennert, “Any Dimensional Reconstruction from Hyperplanar Projections”, MIT AI Memo 805, Oct. 1984.
- T11 J.C. Leitz, J.L. Cambier, M.S. Crone, R. Fries, M.A. Gennert, “Automatic Feature Extraction System No. 2.”, PAR Technology Corp TR PAR-82-19 & RADCTR-83-22, New Hartford, NY, Accession Number ADA130126, Jan. 1983.

## Other Publications

- O1 M.A. Gennert, “Welcome message from the chair”, IEEE Int. Conf. on Technologies for Practical Robot Applications, Woburn, MA, pp. 1, 2015.  
M.A. Gennert, “Welcome message from the chair”, IEEE Int. Conf. on Technologies for Practical Robot Applications, Woburn, MA, pp. 1, 2014.  
M.A. Gennert, “Welcome message from the chair”, IEEE Int. Conf. on Technologies for Practical Robot Applications, Woburn, MA, pp. 1, 2013.  
M.A. Gennert and T. Padir, “Welcome message from the technical program co-chairs”, IEEE Int. Conf. on Technologies for Practical Robot Applications, Woburn, MA, pp. 1, 2012.  
M.A. Gennert and W.R. Michalson, “Welcome message from the technical program co-chairs”, IEEE Int. Conf. on Technologies for Practical Robot Applications, Woburn, MA, pp. 1, 2011.  
M.A. Gennert and W.R. Michalson, “Welcome message from the technical program co-chairs”, IEEE Int. Conf. on Technologies for Practical Robot Applications, Woburn, MA, pp. 1, 2009.
- O2 S.G.W. Dunn<sup>G</sup> and M.A. Gennert, “Using logic in a model-based approach to computer vision”, Selected SPIE Papers on CD-ROM, Vol. 6: Automatic Target Recognition, F.A. Sadjadi (ed.), SPIE Press, Dec. 1999.
- O3 T.W. Bushman<sup>G</sup>, M.A. Gennert, and R.J. Pryputniewicz, “Phase Unwrapping by Least Squares Error Minimization of Phase Curvature”, in “Selected Papers on Interference, Interferometry, and Interferometric Metrology”, P. Hariharan and D. Malacara (Eds.), pp. 422–438, SPIE, 1995.

## Invited Presentations

- I1 “Robotics Engineering as an Undergraduate Major”, Mechatronics Education Innovation Webinar, Feb. 2018.

- I2 “Introduction to MS4SSA Robotics Modules”, Math and Science for Sub-Saharan Africa (MS4SSA), WPI, May 2017.
- I3 “Robots and your job”, MIT Faculty Forum Online, May 2017.
- I4 “Robotics Engineering *or* How to win the ABET Innovation Award”, ABET Annual Meeting, Apr. 2017.
- I5 “The Robotics Revolution: Driving Forces & Applications on Campus”, Society for College and University Planning Meeting, WPI Mar. 2017.
- I6 “Winning i3 (Innovative Ideas with Impact) Presentations”, WPI, Feb. 2017.
- I7 “WPI & Defense Robotics”, Robotics in the UK and US (RUKUS) Symposium, Mar. 2016.
- I8 “Team WPI-CMU & The DARPA Robotics Challenge”, WPI Sigma Xi Lecture, Dec. 2015.
- I9 “Team WPI-CMU & The DARPA Robotics Challenge”, WPI Robotics Engineering Colloquium, Sep. 2015.
- I10 “The DARPA Robotics Challenge: Team WPI-CMU & Lessons Learned”, Raytheon Corp. Webinar, Sep. 2015.
- I11 “The DARPA Robotics Challenge: Team WPI-CMU & Lessons Learned”, AUVSI, Jun. 2015.
- I12 “The DARPA Robotics Challenge: Team WPI-CMU & Lessons Learned”, Mass Technology Leadership Council, Jun. 2015.
- I13 “Systems, Software, & Simulation: Meeting the DARPA Robotics Challenge”, INCOSE, Apr. 2015.
- I14 “Robotics @ WPI: From Human-In-The-Loop to DARPA Robotics Challenge”, MITRE Corp. Seminar, Jan. 2015.
- I15 “Robotics Engineering: A New Frontier in Education & Research”, NSF PI Meeting, Nov. 2014.
- I16 “The New Robotics Ecosystem for Defense & Security”, Armed Forces Communications and Electronics Association (AFCEA), May 2014.
- I17 “Robotics!”, Oxford Hills (ME) Middle School, May 2014.
- I18 “Systems, Software, & Simulation: Meeting the DARPA Robotics Challenge”, Georgia Tech Robotics & Intelligent Machines Seminar, Apr. 2014.
- I19 “WPI Robotics Engineering: Leading the Robotics Revolution”, Essex County Club, Mar. 2014.
- I20 “Robotics Engineering @ WPI”, SUNY Institute of Technology, Mar. 2013.
- I21 “Robotics Engineering @ WPI”, iRobot Corp., July 2013.
- I22 “Robotics Engineering @ WPI”, Rensselaer Polytechnic Institute, July 2013.
- I23 “Robotics Engineering Education”, In-Q-Tel, Nov. 2011.
- I24 “Engineering a Robotics Program, State University of New York at Albany, Nov. 2011.
- I25 “Robotics Engineering Education”, National Defense Industries Association Robotics Division, Sep. 2011.
- I26 “Engineering a Robotics Program from Scratch”, Lawrence Technological University, Mar. 2011.
- I27 “The Future You Create”, WPI RoboEthics Symposium, Apr. 2010.
- I28 “Robotics Engineering: The next hot major”, Robotics Trends’ Robotics Summit, Mar. 2010.

- I29 “Robotics at WPI”, Wachusett Regional High School Science Seminar Series, Feb. 2010.
- I30 “Robotics”, Worcester Pecha Kucha, Sep. 2009.
- I31 “Engineering a Robotics Program from Scratch”, WPI Sigma Xi Induction Keynote Speech, Apr. 2008.
- I32 “Engineering a Robotics Program from Scratch”, IEEE Robotics & Automation Society, Olin College, Feb. 2008.
- I33 “Tracking Patient Respiration and Other Motion in SPECT Imaging Using Stereo Optical Cameras”, (with Prof. M.A. King), Invited Colloquium, Joint Program in Nuclear Medicine, Harvard Medical School, May 2003.
- I34 “The Role of AI and Multimedia in GIS”, Invited Panelist, Wkshp. Advances in Geographic Information Systems, Gaithersburg, MD, Dec. 1994.
- I35 “The Gaea Project: An Overview”, Invited Colloquium, University of New Hampshire, December 1993.
- I36 “Scientific Database Management Systems”, Invited Colloquium, Space Telescope Science Institute, Baltimore, MD, August 1993.
- I37 “Fractals, edge detection, and relaxation labeling for pavement inspection”, Invited Colloquium, University of Massachusetts Medical Center, Worcester, MA, May 1993.
- I38 “From Theory to Application: Surface and lighting models, fractals, edge detection, and relaxation labeling for pavement inspection”, Invited Colloquium, Northeastern University, Boston, MA, June 1992.
- I39 “3D Methods for Volume Quantitation in SPECT”, IEEE Robotics Section, Bedford, MA, March 19, 1991.
- I40 “Regularization Parameter Selection Techniques”, University of Massachusetts Medical Center, Worcester, MA, March 1, 1989.

## Funded Proposals

- FP1 N. Lotfi, M.A. Gennert, J. Mynderse, V. Kapila, “Workshops for the Future of Mechatronic and Robotic Education”, BSF, Aug. 2018, \$49,957 over 12 months.
- FP2 M.A. Gennert, Z. Li, “Actuation, Sensing, and Control of Posture in Dynamic Environments for Improved Vehicle Safety, Phase III”, Toyota Motor Corp., March 2018, \$150,000 over 12 months.
- FP3 M.A. Gennert, M.B. Popovic, K. Troy, “Actuation, Sensing, and Control of Posture in Dynamic Environments for Improved Vehicle Safety, Phase II”, Toyota Motor Corp., March 2017, \$150,000 over 12 months.
- FP4 M.A. Gennert, “Space Robotics Challenge”, NASA, Jan. 2017, \$25,000 over 6 months.
- FP5 M.A. Gennert, M.B. Popovic, K. Troy, “Actuation, Sensing, and Control of Posture in Dynamic Environments for Improved Vehicle Safety”, Toyota Motor Corp., March 2016, \$150,000 over 12 months.
- FP6 M.A. King, M.A. Gennert, C. Lindsay, “A Novel Articulated Robotic Motion Phantom (ARMO) For Ground Truth Motion in Medical Imaging”, UMMS-WPI Collaborative seed funding, June 2015, \$12,433 over 12 months.
- FP7 T. Padir, M.A. Gennert, J. Skorinko, S. Chernova, “RAPID: Realization of a Medical Cyber-Physical System to Enhance Safety of Ebola Workers”, NSF, Dec. 2014, \$200,000 over 12 months.

- FP8 M.A. Gennert, T. Padir, and C. G. Atkeson, “Systems, Software and Simulation: Meeting the DARPA Robotics Challenge”, DARPA, Dec. 2014, \$500,000 over 8 months.  
M.A. Gennert, T. Padir, and C. G. Atkeson, “Systems, Software and Simulation: Meeting the DARPA Robotics Challenge”, DARPA, Jan. 2014, \$995,827 over 12 months.  
M.A. Gennert, T. Padir, and C. G. Atkeson, “Systems, Software and Simulation: Meeting the DARPA Robotics Challenge”, DARPA, July 2013, \$747,958 over 6 months.
- FP9 M.A. Gennert and W.R. Michalson, “Advanced Bayesian Methods for Autonomous Surface Navigation”, SBIR subcontract to Autonomous Explorations, Inc., NASA, May 2011, \$200,000 over 2 years.
- FP10 M.A. Gennert, A Hoffman, J. Sullivan, “Patient Motion Detection and Compensation in SPECT”, subcontract to University of Massachusetts Medical Center, NIH, June 2009, \$337,695 over 4 years.
- FP11 J. Schaufeld, M.A. Gennert, C. Kasouf, ‘A Proposal to Develop a Curriculum-based Module Integrating Innovation and Commercialization Disciplines Into a New Robotics Technology Product Design Platform’, National Collegiate Inventors and Innovators Alliance, Sep. 2008, \$7,000.
- FP12 G. Tryggvason, J.K. Doyle, M.A. Gennert, J. Skorinko, C.A. Randall, “Social Networking in the FIRST Robotics Competition Community”, National Science Foundation, EEC–Engineering Research Centers, Oct. 2007 \$189,500 over 3 years.
- FP13 M.A. Gennert, D. Cyganski, G. Tryggvason, “CPATH CB: Building Community via Robotics Innovations Competition and Conference”, National Science Foundation, CISE Pathways to Revitalized Undergraduate Computing Education, July 2007. \$359,761 over 3 years.
- FP14 M.A. Gennert, “Patient Motion Detection and Compensation in SPECT”, subcontract to University of Massachusetts Medical Center under an NIH grant, June 2003, \$787,104 over 5 years.
- FP15 M.A. Gennert, “Biomedical Imaging Research”, University of Massachusetts Medical Center, September 1997, \$19,980.
- FP16 C.A. Brown & M.A. Gennert, “Generating Topographic Data Sets from Stereo Pairs of Micrographs”, Norton Co. and Torrington Corp., July 1993, \$19,000.
- FP17 C.E. Wills, D. Finkel, M.A. Gennert, and M.O. Ward, “Community Learning in an Introductory Computer Science Course”, WPI Center for Curricular Innovation and Educational Development, May 1993, \$20,880.
- FP18 N.I. Hachem, M.A. Gennert, and M.O. Ward, “Equipment Supplement to IRI-9116988”, National Science Foundation, February 1992, \$11,906.
- FP19 N.I. Hachem, M.A. Gennert, and M.O. Ward, “Research Experience for Undergraduates Supplement to IRI-9116988”, National Science Foundation, February 1992, \$4,000.
- FP20 N.I. Hachem, M.A. Gennert, and M.O. Ward, “Spatio-Temporal Database Management for Global Change Research”, National Science Foundation, September 1991, \$315,000 over 2 years.
- FP21 M.A. Gennert, “Three Dimensional Edge Detection for SPECT Images”, University of Massachusetts Medical Center, June 1990, \$16,690.
- FP22 M.A. Gennert & M.O. Ward, “Using Diverse Knowledge for Map Interpretation”, WPI Research Development Council, April 1990, \$5,400.
- FP23 M.A. Gennert & R.E. Kinicki, “Hewlett-Packard University Grants Program”, Hewlett-Packard Corporation, May 1989, \$49,175.
- FP24 M.A. Gennert, “Expert System Diagnostic Assistant Prototype”, Bytex Corporation, January 1989, \$22,892.

FP25 M.A. Gennert, “Continuation of Stereo Vision Research”, WPI Research Development Council, March 1988, \$9,111.

FP26 M.A. Gennert, “Image Brightness Surface Matching”, WPI Research Development Council, November 1987, \$3,887.

### **Post-Doctoral Researcher Supervision**

PD1 Clifford Lindsay, “Motion Correction in Medical Imaging”, May 2011–present.

### **Ph.D. Dissertation Supervision**

PHD1 Jonathan Shutt, “Fexprs as the basis of Lisp function application or \$vau : the ultimate abstraction”, 2011.

PHD2 Songxiang Gu, “Body Deformation Correction for SPECT Imaging”, 2009.

PHD3 Yuhong Zhang (chaired Dissertation Committee while Prof. M.O. Ward was on sabbatical leave) “A Visual Environment for Scientific Data Analysis”, 1994.

### **Ph.D. Dissertation Committees**

PC1 Benzun Babu, “Detection and Resolution of Motion Conflict in Visual Inertial Odometry (VIO), Profs. R.J. Duckworth, D. Cyganski advisors, 2018.

PC2 Lei Wang, “System Designs for Diabetic Foot Ulcer Image Assessment”, Prof. P. Pedersen advisor, WPI, 2016.

PC3 Jason Kutarnia, “A Markov Random Field Based Approach to 3D Mosaicing with Application to Ultrasound Simulation”, Prof. P. Pedersen advisor, WPI, 2014.

PC4 Nabin Malekar, “Autonomous Entropy-Based Intelligent Experimental Design”, Prof. K. Knuth advisor, SUNY Albany, 2011.

PC5 Serdar Ince, “Occlusion-Aware Intermediate View Reconstruction”, Prof. J. Konrad advisor, Boston University, 2008.

PC6 Fan Wu, “Ubiquitous Scalable Graphics: An End-to-End Framework using Wavelets”, Prof. E.O. Agu advisor, WPI, 2008.

PC7 Mohamad J. Seaidoun, “A Fast Exact Euclidean Distance Transform with Application to Computer Vision and Digital Image Processing”, Prof. J.M. Gauch advisor, Northeastern University, 1992.

PC8 Yi Liu, “Analytic Hough Transform for Conic Curve Detection”, Prof. D. Cyganski advisor, October 1991.

PC9 Buming Bian, “Accurate Simulation of Scene Luminances”, Prof. N. Wittels advisor, June 1990.

PC10 Wei Li, “Object Recognition by Neural Networks”, Prof. N.M. Nasrabadi advisor, April 1990.

### **M.S. Thesis Supervision**

MS1 Ramkumar Natarajan, “Efficient Factor Graph Fusion for Multi-robot Mapping”, 2017.

MS2 Bhawna Shiwani, “Autonomous Real-Time Tracking of Bradykinesia in Parkinson’s Disease During Unconstrained Activities”, 2017.



- MS3 Aditya Bhat, “Locomotion Trajectory Generation For Legged Robots”, 2017.
- MS4 Donald Bourque, “CUDA-Accelerated ORB-SLAM for UAVs”, 2017.
- MS5 Lening Li, “BiRRTOpt: A Combined Software Framework for Motion Planning Applied on ATLAS Robot”, 2016.
- MS6 Justin Barrett (Prof. W. Michalson co-advisor), “Robot Navigation”, 2014.
- MS7 Benzun Pious Wisely Babu, “Visual Simultaneous Localization and Mapping for a Tree Climbing Robot”, 2013.
- MS8 Satyanarayana Reddy Janga, “A Fast and Robust Image-Based Method for tracking Robot-assisted Needle Placement in Real-time MR Images”, 2013/
- MS9 Ellery Harrington, “Development of an Optoelectronic Holographic Platform for Otolaryngology Applications”, Prof. C. Furlong-Vazquez co-advisor, 2009.
- MS10 Andrey Sklyar, “Determining Realistic Organ Motion for Testing SPECT Motion Correction Algorithms”, WPI & UMass Medical School, 2009.
- MS11 Linna Ma, “Splitting Frames by Hypothesis Testing for Patient Motion Compensation in SPECT”, WPI & UMass Medical School, 2006.
- MS12 Suman Nadella, “Multi Camera Stereo and Tracking Patient Motion for Compensation in SPECT Scanning Systems”, WPI & UMass Medical School, 2005
- MS13 Dimitri Lisin, “Deformable Models”, supported by UMass Medical School, 1998.
- MS14 Anuj Bansal, “Distributed Computing Of Derived Data In Scientific Databases”, Prof. N.I. Hachem co-advisor, 1995.
- MS15 Danielle Koschmeder, “Exploiting Parallelism and Fuzzy Logic for Fishery Management”, Dr. R. Larowe co-advisor, 1995.
- MS16 Thomas Bushman, “Holographic Phase reconstruction”, Prof. R.J. Pryputniewicz co-advisor, 1993.
- MS17 Hemen Shah, “Implementing a VLSI Median Filter”, Prof. W.H. Eggimann co-advisor, 1992.
- MS18 Jeffrey Choate, “A Vision System for the Analysis of Pavement Distress”, 1992.
- MS19 David Gosselin, “Three Dimensional Boundary Detection Using Continuous Relaxation Labeling”, May 1991.
- MS20 Philipp Sutter, “Minimum Distance PET Reconstruction using the Min-Max Principle”, September 1991.
- MS21 Richard Wood, “A Neural Network that uses a Hebbian/Back Propagation Hybrid Learning Rule”, December 1991.
- MS22 Biao Ren, “A Coherent Theory of Stereo”, May 1989.
- MS23 Jonathan Malin, “Stereo Vision Using Gabor Receptive Fields”, August 1989.
- MS24 Eddy Lin, “Predictive Vector Quantization for Image Coding”, Prof. N.M. Nasrabadi co-advisor, December 1988.

### **M.S. Thesis Reader / Committee Member**

- MC1 Janani Mohan, “Dynamic Task Allocation in Robot Swarms with Limited Buffer and Energy Constraints”, Prof. C. Pinciroli advisor, 2018.
- MC2 Shlok Agarwal, “Exploring Applications and Improving Efficiency of Legged Systems”, Prof. M.B. Popovic, advisor, 2018.
- MC3 Yicong Xu, “Goal Based Human Swarm Interaction for Collaborative Transport”, Prof. C. Pinciroli, advisor, 2018.
- MC4 Vishnu Sudheer Menon, “Decentralized Approach to SLAM using Computationally Limited Robots”, Prof. C. Pinciroli advisor, 2017.
- MC5 Ria Pereira, “Interactive Behavior for Humanoid Robot Mediated Applied Behavioral Analysis Autism Therapy”, Prof. G.S. Fischer advisor, 2017.
- MC6 Chinmay Harmalkar, “Dynamic Viscoelastic Model of the Hydro Muscle and the Control of a Multi-fiber Hydro Muscle Actuated Bionic Ankle”, Prof. M. Popovic advisor, 2017.
- MC7 Koushik Balasubramanian, “Perception Framework for Activities of Daily Living Manipulation Tasks”, Prof. T. Padir advisor, 2016.
- MC8 Ruixiang Du, “An Intelligent Portable Aerial Surveillance System Modeling and Image Stitching”, Prof. T. Padir advisor, 2013.
- MC9 Clifford Lindsay, “Real-Time Rendering of Wavelength-Dependent Phenomena Using Spherical Harmonics”, Prof. E.O. Agu advisor, 2007.
- MC10 Rimma V. Nehme, “Continuous Query Processing on Spatio-Temporal Data Streams”, Prof. E.A. Rundensteiner advisor, 2005.
- MC11 Shilpa N. Kinkar, “Development and Application of Semi-automated ITK Tools For the Segmentation of Brain MR Images”, Prof. John Sullivan advisor, 2005.
- MC12 Nina Serrao, “An Implementation of the Derivation Semantics Layer of the Gaea Prototype”, Prof. N.I. Hachem advisor, 1994.
- MC13 David Paist, “Efficient Implementation of Object-Oriented Constructs for a RISC Architecture”, Prof. K.A. Lemone advisor, 1994.
- MC14 Stuart Wells, “Interaction Between Different Domain Constraint Knowledge in the Control of Image Segmentation”, Prof. M.O. Ward advisor, 1993.
- MC15 John Rasku, “Approximate Shape Comparison Using Correlation Images”, Prof. M.O. Ward advisor, 1993.
- MC16 Frederick W. Wheeler, “The Registration of Range Images and Synthetic Aperture Range Images of Terrain Scenes”, Prof. R.F. Vaz advisor, May 1992.
- MC17 George Dainis, “Rule Based Visual Inspection”, Prof. M.O. Ward advisor, October 1991.
- MC18 Jeffrey LeBlanc, “N-Land: A Visualization Tool for N-Dimensional Data”, Prof. M.O. Ward advisor, May 1991.
- MC19 David Nedde, “Visual DNA Sequence Comparison using Correlation Images”, Prof. M.O. Ward advisor, May 1991.
- MC20 Suresh Rajasekaran, “Control Mechanism for Image Segmentation using Domain Constraint Knowledge”, Prof. M.O. Ward advisor, October 1990.
- MC21 Jeffrey Wilson, “The Generation of Acronyms”, Prof. L.A. Becker advisor, December 1989.

- MC22 David V. Pergola, “A Planner for Problems with Finite but Incomplete Knowledge”, Prof. L.A. Becker advisor, May 1989.
- MC23 Tuay-Ling K. Lang, “Feasibility of Image Segmentation Using Domain Constraint Knowledge”, Prof. M.O. Ward advisor, May 1989.
- MC24 Howard Rafal, “Cartographic Character Recognition”, Prof. M.O. Ward advisor, May 1989.
- MC25 Mark Roy, “Acquiring and Representing Manufacturing Process Knowledge”, Prof. L.A. Becker advisor, May 1988.

## Directed Research

- DR1 Koushik Balasubramanian, Vinayak Jagtap, Ajay Prabhu, “Footstep Planning”, Semesters: F15, S16.
- DR2 Benzun Babu, Lening Li, “DARPA Robotics Challenge, Semesters: F14 (BB), S15 (LL).
- DR3 Benzun Babu, “Tree-Climbing Robot Vision”, Semesters: F11, S12.
- DR4 Neeru Arora, “Medical Imaging Motion Research”, 2004
- DR5 Mikhail Mikhailov, “Petri Nets”, 1997.
- DR6 John Shutt (with Prof. Roy S. Rubinstein), “Self Modifying Finite Automata”, 1995.
- DR7 Hemen Shah, “Implementing a VLSI Median Filter”, Prof. W.H. Eggimann co-advisor, 1992.
- DR8 Biao Ren, “Coherent Theory of Stereo”.
- DR9 Jingwen Liu and Maryann Spillane, “Expert System Diagnostic Assistant Prototype”.
- DR10 Gary Gu, “The Boundary Element Method for Problems in Early Vision”.
- DR11 Jonathan Malin, “Gabor Filters for Stereo Vision”.
- DR12 Elliot Mednick and John Whitson, “A Scalable Architecture for a VLSI Implementation of Median Filtering”, Prof. W.H. Eggimann co-advisor.
- DR13 David Gosselin and Jeffrey LeBlanc, “Fractal Synthesis and Analysis of Pavement Distress”.
- DR14 Barton Kincaid, “A New VLSI Median Filter Architecture”, Prof. W.H. Eggimann co-advisor.
- DR15 Maruuf Ali, “Fractal Analysis of Pavement Distress”.

## Major Qualifying Projects (WPI Senior Capstone Projects)

- MQP1 Breanne Happell, Karen Orton, Kevin Ouellette, Charles Sinkler, (Profs. C.B. Putnam, K.A. Stafford, co-advisors) “Blisk Inspection System”, Terms A16, B16, C17, D17, Sponsored by GE Aviation.
- MQP2 Odell Dotson, Katie Gandomi, Alora Hillman, Nicholas Panzarino, (Profs. J. Fu, K.A. Stafford, co-advisors), “CARP: Custom Autonomous Robotic Painter”, Terms A16, B16, C17, D17.
- MQP3 Devon Bray, Mead Landis, Rachael Putnam, (Profs. B.A. Miller, K.A. Stafford, co-advisors), “CHAMP: Tree Climbing Robot”, Terms A16, B16, C17, D17.
- MQP4 Paula Rudy, “Facial Recognition using Sparse Data Representation on an Open Source Neural Network Model”, Terms: C16, D16, E16, A16, B16, C17, D17.

- MQP5 Nathan George, Alec Thompson, (Prof. J. Beck, co-advisor), “Deep Q-Learning for Walking in Humanoid Robots”, Terms A15, B15, C16, D16.
- MQP6 Batyrlan Nurebkov, “Deep Learning for Walking”, Terms A15, B15, C16, D16.
- MQP7 Amanda Adkins, William Barnard, Matthew Beardsley, Charles Frick, Samantha Swarz, (Profs. H.C. Lauer, F.J. Looft, co-advisors), “SuitUp! Wearable Haptic Controller”, Terms A15, B15, C16, D16.
- MQP8 Thomas Clark, Jonathan Leitschuh, (B.A. Miller, advisor), “Computer Vision User Interface”, Terms: A15, B15, C16, D16.
- MQP9 William Jones, “Project Squirrel 2.1”, Term E15.
- MQP10 Daniel Fitzgerald, (Prof. M. Popovic, advisor), “Quadruped Robot”, Terms C15, D15.
- MQP11 Elizabeth Brown, David Pounds, Michael Strickland, Alexander Stylos, (Prof. K. Stafford, co-advisor), “Project Squirrel: A Tree Climbing Robot”, Terms A14, B14, C15.
- MQP12 Zachary Estep, James Megin, Evan Richard, (Prof. T. Padir co-advisor), “Cloud Robotics”, Terms A14, B14, C15.
- MQP13 Emanuel DeMaio, David Ilacqua, Louie-John Mistretta, Matthew Simpson, (Prof. K. Stafford, co-advisor), “Tree Climbing Robot”, Terms A13, B13, C14.
- MQP14 Henrique Polido, (Prof. A Heinricher, co-advisor), “DARPA Robotics Challenge”, Terms B13, C14, D14.
- MQP15 Ian Campbell, Eric Cobane, Ryan Giovacchini, Thomas Womersley (Prof. Z. Hou, co-advisor), “Tree Climbing Robot”, Terms A12, B12, C13, D13.
- MQP16 Daphne Gorman (Profs. R. Ludwig, S. Makarov, co-advisors), “Analysis, Computation and Validation of the Coupling of Any Two Elements in Transmit and Receive Phased Array”, Terms: A11, B11, Sponsored by Mitre Corp.
- MQP17 Justin Gostanian, Erick Read, “Tree-Climbing Robot”, Terms: A11, B11, C12.
- MQP18 Clark Bakstran, Scott Brooks, Angelo Platanius, Greg Sletterink, Nick Solarz, Thomas Womersley, “Multiple Autonomous Surface Vehicle Project: Robotic Kayak”, Terms: A11, B11, C12. Performed in conjunction with Santa Clara University.
- MQP19 Joseph Sceviour, Charles Petano, Ellery Harrington, Daniel Czarnecki (Profs. C. Furlong-Vazquez, F.J. Looft co-advisors), “Multi-functional autonomous solar-hydrogen robot”, Terms A06, B06, C07, D07.
- MQP20 James Tyrrell, Bryan Shah, “Real-time pill counting”, Terms: A06, B06, C07, Sponsored by APPS, Inc.
- MQP21 Kevin Rohleder, Timothy Moloy, Arno Hautala, “Digital image processing at NASA Johnson Space Center”, Term: C04, Sponsored by NASA.
- MQP22 Mason Winner, Vince Bullinger, “Forensic image analysis”, Terms: A03, B03, C04.
- MQP23 James Wang, Andre Quina, Joseph Ho (Dr. M.A. King co-advisor), “Detecting patient respiratory motion in SPECT imaging using stereo optical web cameras”, Terms: A02, B02, C03, Sponsored by UMass Medical School.
- MQP24 Dennis Jansky (Prof. W.W. Durgin co-advisor) “Design and implement a more generic API for Robonaut”, Term: C03, Sponsored by NASA.
- MQP25 Joseph Devlin, “Programming sound visually — a visual programming language for audio sequencing and manipulation”, Completed: C03.

- MQP26 Gleb Ralka, Ben Kurtz, Jonathan Oexner. “Parsing using recursive adaptive grammars”, Completed: D02.
- MQP27 Christopher Tashjian, John Brosnan, “Scheme evaluator in Java”, Terms: A99, B99, C00, D00.
- MQP28 Justin Brzozoski (Prof. M.L. Claypool co-advisor), “MPEG jitter”, Terms: A98, B98, C99, D99.
- MQP29 Justin Dyer, Linda Browne, “CUE — Pool Critic II”, Terms: B98, C99, D99.
- MQP30 George Campbell, David Hawes, Carleton Jillson, Joseph Kalinowski, Keith Pray, “CUE: The Pool Critic”, Terms: A97, B97, C98, D98.
- MQP31 Jesse Zbikowski, “Matroid Categories”, Terms: C97, D97, A97, D98.
- MQP32 John Pazniokas, Alison Miles, “A Web-Based Scheme Interpreter”, Terms: B97, C98.
- MQP33 Stephen Kazmierczak, John West, “Speak to Me”, Terms: A97, B97, C98.
- MQP34 George Campbell, Michael Caprio, Steven Lawler, “VALIS: A Fuzzy Strategy Game in Java”, Terms: B96, C97, D97.
- MQP35 David Bishop, Edward Hallissey, “Scheme Interpreter in Java”, Terms: B96, C97, D97.
- MQP36 Matthew Tricoli, “Design of an Intelligent Structure”, Terms: A96, B96, C97, D97.
- MQP37 Israel Di Peri, Alexandru Nemetz, “Radar Signal Identification Using Neural Networks”, Term: B96, Sponsored by Naval Research Laboratory.
- MQP38 Rollin Crittendon, “Category Theory and its Applications in C.S.”, Terms: B95, C96, D96.
- MQP39 Joseph Branciforte, Scott Gray, “A Software Controller for a Maze Solving Robot”, Terms: A93, B93, C94, D94.
- MQP40 Corey Jenks, “Computer Image Analysis of Protein Filaments within Muscle Fiber”, Terms: B93, C94, D94, Sponsored by UMass Medical School.
- MQP41 Douglas Wright, Benjamin Lee (Profs. W.W. Durgin, L. Schaffer co-advisors) “Computerized Graphic Mission Planning for Unmanned Interplanetary Travel”, Terms: A93, B93, C94, D94.
- MQP42 Daniel Mackin, Masal Almashan (Prof. W.H. Eggimann co-advisor), “Micromouse 3: The Theseus Project”, Terms: A93, B93, C94, D94.
- MQP43 Michael Bruce (Prof. P.L. Levin co-advisor), “Implementing the GEODAD Interface using the Entity-Relational Approach”, Terms: C93, D93, E93.
- MQP44 Suppasak Collins, Kevin Geoffrey (Profs. N.I. Hachem, M.O. Ward co-advisors), “Polymorphic Operators for the Scientific Analysis of Raster based Map Data”, Terms: A92, B92, C93, D93.
- MQP45 Erik Currin (Profs. N.I. Hachem, M.O. Ward co-advisors), “Visualizing Spatio-Temporal Data in a Global Change Research Project”, Terms: A92, B92, C93, D93.
- MQP46 Tony Campbell, Kimberly Cherko (Profs. W.H. Eggimann, D.B. Walcerz co-advisors), “The Mechanical Systems Design of WPI Micromouse 3”, Terms: A92, B92, C93, D93.
- MQP47 Stephen Pettiglio, Kenneth Chan (Pres. J.C. Strauss co-advisor), “Computer Aided Cognitive Rehabilitation”, Terms: A92, B92, C93.
- MQP48 Richard Bombard, Douglas Finkle, Mark Turbitt (Prof. D.W. Nicoletti co-advisor), “Performance Evaluations of 3-D Image Restoration Algorithms”, Terms: C92, D92, A92.

- MQP49 Nevo Hed, Allen Martin (Prof. R.F. Vaz co-advisor), “Motion Analysis”, Terms: C92, D92, E92.
- MQP50 Brian McMorro (Prof. M.O. Ward co-advisor), “Geographic Information Systems”, Terms: C91, D91, E91.
- MQP51 William Clogston, Aaron Laznovsky, Michael Wallent (Prof. S.M. Selkow co-advisor), “Neural Network Addition and Chaos”, Terms: A90, B90, C91, D91.
- MQP52 Peter Chestna, Robert Douglas, Parrish Heppenstall, Marshall Robin, “Self-Diagnosing Systems”, Terms: A90, B90, C91, D91, A91.
- MQP53 Kenneth Hinckley (Prof. M.O. Ward co-advisor), “The Visual Comparison of Three Sequences”, Terms: A90, B90, C91.
- MQP54 Gregory Frizzle (Prof. M.O. Ward co-advisor), “A Taxonomy of Data Visualization”, Terms: A90, B90, C91.
- MQP55 Ann Marie O’Connor, Scott Plichta (Prof. M.O. Ward co-advisor), “MID: MOTIF Interface Designer”, Terms: D90, A90, B90, C91.
- MQP56 Gary Pratt, Susan Tabur (Prof. S.M. Selkow co-advisor), “Natural Language Database Access”, Terms: A89, B89, C90, D90.
- MQP57 Robert Petit, Richard Wood, “Speech Recognition by Neural Networks”, Terms: A89, B89, C90, D90.
- MQP58 Charles Miller, “Simulating Chaotic Systems”, Terms: A89, B89, C90, D90.
- MQP59 David Gosselin, Jeffrey LeBlanc, Kathleen O’Sullivan, “Self Diagnosing Systems”, Terms: A88, B88, C89.
- MQP60 Ronald Avis, “Neural Network Simulation”, Terms: B87, C88, D88.

### **Interactive Qualifying Projects (WPI Junior Science & Society Projects)**

- IQP1 Alexander Ruggiero, Sebastiano Salvo, Chase St. Laurent, (Prof. G. Salazar, co-advisor), “Robotics in Construction”, Terms A15, B15, C16. Sponsored by MassPort.
- IQP2 Kevin Valente Comas, Trung-Nghia Huynh, “Roadmap for Research in Robotics for Ebola”, Terms A15, B15, C16.
- IQP3 Asma Chaudri, Natalia Henao, Zahra Maqsood, “Future Assistive Robots”, B13, C14, D14.
- IQP4 Christopher Conley, Gilmar Da Vitoria, Jessica Gwozdz, Olivia Hugal (Prof. C. Putnam, co-advisor), “Virtual Textbook”, A12, B12, C13, D13.
- IQP5 Sidney Batchelder, Robert Le, William Terry, Jeffrey Thomas, “An Analysis of Future Sustainable Aquatic Farming”, Terms: A11, B11, C12.
- IQP6 Timon Butler, Jonathan Estabrook, Joe Funk, James Kingsley, Ryan O’Meara, “RBE Wiki for Independent Learning”, Terms: B10, C11, D11.
- IQP7 Samuel Kaplan, Andrew Yee (Dr. R.D. Beach co-advisor), “Building a Community: Refining the Robotics Innovation Competition and Conference”, Terms: A08, B08, C09, D09.
- IQP8 Robert Breznak, William Hnath, Alexander Muir (Dr. R.D. Beach co-advisor), “Robotics Innovation Competition and Conference”, Terms: A07, B07, C08.
- IQP9 Petre Rontea, “Literary value in video game technology”, Terms: A06, B06, C07.

- IQP10 Ryan Kenyon, Benjamin Holt, Alexander Goodrich, “Simplifying the relationship between programmers and computers”, Terms: A00, B00, C01.
- IQP11 Christopher Tashjian, “Reevaluating programming language concepts”, Terms: A99, B99, C00, D00.
- IQP12 Asima Silva, Kirk Johnson, “Unlimited learning”, Terms: B98, C99, D99, Sponsored by Central Tree Middle School.
- IQP13 Lisa Rafferty, Kenda Conklin, Joy Ann Benedix, “The implementation of technology in education”, Terms: A98, B98, C99, Sponsored by Central Tree Middle School.
- IQP14 Peter Launie, Kevin Nordberg, David Gray, “Computers in Education”, Terms: A97, B97, C98, D98, Sponsored by Blackstone Regional Technical Vocational High School.
- IQP15 Robert Bukofser, Kurt Deschler, Brady Schulman, Tim Scully, “Networking Blackstone Valley Regional Vocational Technical High School” Terms: B97, C98, D98, Sponsored by Blackstone Regional Technical Vocational High School.
- IQP16 David Geremia, Leigh Perry, “The Effectiveness of the Veterinary Health Diagnostic Program”, Terms: D97, E97, A97.
- IQP17 Joe Kalinowski, David Hawes, “Computers in Education”, Terms: A96, B96, C97, Sponsored by Blackstone Regional Technical Vocational High School.
- IQP18 Patrick Delahanty (Prof. N.I. Hachem co-advisor), “Databases and Personal Privacy”, Terms: a93, B95, C94, D94.
- IQP19 Michael Henry, “Graphics Elementary Style”, Terms: B90, C91, D91.
- IQP20 Martin Arnold, John Erickson, Pamela Murphy, “Integration of Computers for Elementary Education”, Terms: A88, B88, C89.
- IQP21 Robert Song, “LOGO as a Learning Tool”, Terms: A88, B88.

### **Preliminary Qualifying Projects**

- PQP1 Kevin Rohleder, Timothy Moloy, Arno Hautala, “Digital image processing at NASA Johnson Space Center”, Term: B03.
- PQP2 Ann Marie O’Connor, Scott Plichta, “Integrating the OBVIUS Image Understanding System and X”, Term: C90.
- PQP3 Israel Di Peri, Alexandru Nemetz, “Radar Signal Identification Using Neural Networks”, Term: A96, Sponsored by Naval Research Laboratory.

### **Independent Studies/Projects**

- ISP1 Nicholas Cyganski, “DARPA Robotics Challenge”, Term B13.
- ISP2 Sidney Batchelder, Adam Vadala-Roth, “Computer Vision”, Term D13.
- ISP3 Chris King, “Implementation of a Small-Device ML Compiler with Data Width Inference”, Term: D06.
- ISP4 Asima Ali, Michael Ciman, Pierre De Galbert, Leonard Frank, Alexander Goodrich, John Gulbrandsen, Seth Hardy, Benjamin Kurtz, Karl Lackner, Jonathan Oexner, Gleb Ralka, Sigmund-Bryan Villamin, “Advanced Mathematics for Computer Science”, Term A00.

- ISP5 Sean Dunn, Nicholas Leazard, “Cartoon Video ISP”, Term: D99.
- ISP6 Ryan Kenyon, “Compiling Scheme”, Term: D99.
- ISP7 Robert McDonald, (Prof. M.L. Claypool co-advisor), “MPEG jitter”, Terms: A98, B98.
- ISP8 George Campbell, David Hawes, Carleton Jillson, Joseph Kalinowski, Keith Pray, Jonathan Tanner, “Computer Vision”, Term: A97.
- ISP9 Justin Di Peri, “Chaoscopy”, Term: D97.
- ISP10 Adam Egddall, John Guris, Michelle Hammar, Ming He, Heli Kokk, Stefan Kotsonis, John Shutt, Stephan Taylor, David Vasconcelos, William Warner, “Denotational Semantics”, Term: D94.
- ISP11 John Dunkelberg, “Neural Networks”, Term: D92.
- ISP12 Michael Cox, Mark Simpson, “MIM: Mid in Mid”, Term: B91.

### **Sufficiency (WPI Sophomore-Level Project)**

- SUFF1 Kevin Beaulieu, “The Future of AI”, Term: A88.

### **Reviewer**

#### REV1 Journals:

Artificial Intelligence for Engineering Design, Analysis and Manufacturing (AIEDAM)  
 Computer Vision, Graphics, and Image Processing–Image Understanding (CVGIP-IU)  
 IEEE Trans. on Education (IEEE-TED)  
 IEEE Trans. on Knowledge & Data Engineering (IEEE-TDKE)  
 IEEE Trans. Nuclear Science (IEEE-TNS)  
 IEEE Trans. Pattern Analysis and Machine Intelligence (IEEE-PAMI)  
 Int. J. Advanced Robotic Systems (IJARS)  
 J. Optical Society of America (JOSA)  
 Machine Vision and Applications (MVA)

#### REV2 Conferences and Symposia:

ACM Conf. on Information and Knowledge Management (CIKM)  
 ACM Computer Science Conf. (CSC)  
 IEEE Computer Society Conf. on Computer Vision and Pattern Recognition (CVPR)  
 IEEE Int. Conf. on Robotics and Automation (ICRA), *Associate Editor 2013*  
 IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)  
 IEEE Int. Conf. on Technologies for Practical Robot Applications (TePRA), *Technical Program Co-Chair, 2009, 2011, 2012, General Chair 2013, 2014, 2015*  
 International Conference on Scientific and Statistical Database Management (SSDM)  
 New England Manipulation Society Symp. (NEMS)  
 New England Programming Languages & Systems Symp. (NEPLS)  
 New England Robotics Colloquium (NERC) *Local Chair, 2015*  
 Robotics Innovations Competition & Conference (RICC), *General Chair, 2009, 2011*  
 Robotics Summit & Expo, *Advisory Board, 2018*

#### REV3 Funding agencies:

Advanced Robotics for Manufacturing Institute  
 Los Alamos National Laboratory  
 Maryland Industrial Partnerships  
 National Institutes of Health  
 National Science Foundation



## REV4 Publishers:

MITPress  
W.H. Freeman

## REV5 Educational Institutions:

Commonwealth of Massachusetts Department of Education  
Lawrence Technological University  
Oak Ridge Associated Universities  
Quinnigamond Community College  
University of Detroit Mercy

**Professional Organizations**

ABET, *Program Evaluator*

Advanced Robotics for Manufacturing (ARM) Institute, *Education & Workforce Advisory Council member*

American Society for Engineering Education

Association for Computing Machinery, *Senior member*

CSAB, Inc.

Institute of Electrical and Electronics Engineers, *Senior member*

Institute of Electrical and Electronics Engineers Computer Society

Institute of Electrical and Electronics Engineers Robotics & Automation Society

Massachusetts Technology Leadership Council Robotics Cluster

Eta Kappa Nu (Electrical Engineering Honor Society)

Upsilon Pi Epsilon (Computer Science Honor Society)

Sigma Xi (Scientific Honor Society)

**Awards & Honors**

ABET Innovation Award, 2016. *Accepted on behalf of the WPI Robotics Engineering Program.*

Coleman Fellow, 2015-present.

WPI Rho Beta Epsilon (Robotics Engineering Honor Society) Award for Excellence in Robotics Education, 2014.

Kern Entrepreneurial Engineering Network (KEEN) Fellow, 2011-2012.

WPI Tau Beta Pi (Engineering Honor Society) Award for Outstanding Academic Advising, 1998.