Mark Paulik, Ph.D.
Curriculum Vitae

Professor and Director
Robotics and Mechatronic Systems Engineering
Electrical and Computer Engineering Dept.
University of Detroit Mercy
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PROFILE

Experienced in leadership, academic administration, faculty mentoring, recruitment, ABET accreditation, teaching, research, and grant writing. Effective with industrial and government research partners. United States Citizen.

EDUCATION

Ph.D., Systems/Electrical Engineering (ECE: 2D Signal/Image Processing)   June 1989
Oakland University; Rochester, Michigan

Science Masters, Electrical Engineering (Embedded Systems)   June 1983
Massachusetts Institute of Technology; Cambridge, MA

Bachelor of Electrical Engineering   May 1981
University of Detroit; Detroit, Michigan

PROFESSIONAL EXPERIENCE

Professor of Electrical and Computer Engineering   **August 2001 - Present**
University of Detroit Mercy (UDM)

    Chairperson, Department of Electrical and Computer Engineering,   **August 2015 - 2016**
    August 2007 - 2010

- Prepared ABET self-study documents for the Electrical Engineering program. Team visit: October 2016 (successful)
- Prepared ABET self-study documents for the new Robotics and Mechatronic Systems/Electrical Engineering program. Team visit: October 2016 (successful)
- Negotiated the addition of one new tenure-track faculty line (search underway) and two new instructor faculty lines (hired August 2016)
- Wrote the self-study and led the department through a successful ABET accreditation in 2010.
- Developed a 5-year Bachelors/Masters program in Robotics Engineering.
- Negotiated the addition of two new faculty lines and hired two new ECE faculty (2009)

    Program Director, Robotics and Mechatronic Systems Engineering (new program launch),
    University of Detroit Mercy,   **2012 - Present**

- Coordinated curriculum design and development

- Assisted with the development and launch of a Robotics and Mechatronic Systems 3+2 program with multiple Chinese Universities. Program launch: Fall 2017.
- Developed marketing materials (website, banners, brochures, and giveaways) and personally represented the program at FIRST competitions in Michigan (4 years), and 30 high schools (visits and demonstrations).
- Authored grants for cash and in-kind donations to develop the Department's robotic systems equipment base:
  - NovAtel Propak-6 DGPS dual-antenna SPAN system ($20,000) for IGVC: 2017
  - DENSO Radar Demonstration Kiosk + two add'l. Radar units: 2017
  - $50,000 DENSO award for the 2016-17 academic year
  - Three DENSO Dedicated Short Range Comm. (DSRC) radios for V2V: 2015
  - $50,000 DENSO award for the 2014-15 academic year
  - KVH Industries, KVH-5100 fiber optic three axis IMU ($15,000), IGVC 2013
  - $50,000 DENSO award for the 2012-13 academic year
  - Ford Blue Oval awards 2012, 2013, 2015 ($12,500)

Acting Deputy Director, Ground Robotics Reliability Center (GRRC),   **August 2010-2011**
University of Michigan, Ann Arbor, MI

Member, Executive Committee, Ground Robotics Reliability Center (GRRC),
University of Michigan, Ann Arbor,   **August 2009-2011**

Director of the College Advanced Mobility Lab (AML)   **2006 - Present**
- Established the lab for the study of autonomous and assistive robotics at Detroit Mercy.

Chair, University Strategic Planning Team: **October 2005-January 2008**
- Developed planning documents for the university; reported to the University President, October 2005-January 2008.

ABET
- Principal author and editor for the complete ECE ABET volume II documents, 2004.

Chair, ECE Department Curriculum Committee: **August 2001-August 2012**
- Directed the complete redesign and implementation of an innovative undergraduate ECE curriculum characterized by a Spiral topical structure, Enquiry-Based-Learning studio design projects, and a motivational multi-year project structure.
- Developed/directed multimedia program marketing materials (CD and brochure) for presentation of the integrated curriculum initiative (ECE) 2006-2007.
- Participated in development of an Interdisciplinary (Electrical and Mechanical Engineering) graduate Mechatronics specialization 2002-2004.
- Developed undergraduate Computer Engineering specialization program 2001-2004, 2006.

Developed an Interdisciplinary two-semester Capstone Design Sequence,   **2003-2012**
- Established a collaboration between Electrical & Mechanical Engineering Departments based on autonomous ground vehicle development for participation in the Intelligent Ground Vehicle Competition IGVC.
- 2015 — Top ten in Autonomous Challenge, Best Qualification performance.

- 2012, 2013 — First and Second place in Joint Architecture for Unmanned Systems (JAUS) competition, 6th place Design.
- 2008, 2009, 2010 — Winner First Place Overall IGVC
- 2006, 2007 — Winner Third Place Overall IGVC
- 2005 — Sixth Place Autonomous Challenge Competition IGVC

Associate Professor of Electrical and Computer Engineering   **August 1992 - August 2001**
University of Detroit Mercy

Assistant Professor of Electrical and Computer Engineering   **August 1989 - August 1992**
University of Detroit Mercy

INDUSTRIAL EXPERIENCE

Associate Engineer, Advanced Product Development, Product Engineering   **May 1981 - Aug 1989**
General Motors / Delphi Division, Flint, MI (full-time, leave, and consultation)

- Development of embedded automotive systems (LCD Instrument cluster, Capacitive fuel level sender, Transmission duty-cycle sensor, Engine misfire detector)

Consultant services   **June 1995 - Sept. 2006**

- Technology Properties LTD, San Jose, California, "Async. Array Device Project", October 2003-2006.
- Mobile Data Systems, Farmington, MI: Development of a Smart Cable microcontroller based automotive diagnostic system 1996.
- Consultant for Detroit patent attorney Denise Glassmeyer (patent disclosure expert review) 1995-96 (General Motors).

AWARDS

- Five times nominated for the Engineering Teacher of the Year award (2017 most recent).

- Awarded Sabbatical Leave: Probabilistic Robotics, 2011-12

- Twice Nominated: University of Detroit Mercy Distinguished Faculty Award, 2005, 2007

- Best Student Paper Award: SPIE Optics East, Robert T. McKeon, Mark Paulik, and Mohan Krishnan, "Lane Identification and Path Planning for Autonomous Mobile Robots," SPIE Optics East, Boston, MA, October 2006

- Invited: NSF Department Level Reform Review Panel, Washington D.C., April 15-16, 2004

- Awarded Sabbatical Leave: Embedded Systems Curriculum Development, 2002-03

- Best Paper Award, IEEE Transactions on Education, Mark Paulik and Mohan Krishnan, "A Competition Motivated Capstone Design Course: The Result of a Fifteen Year Evolution," IEEE Transactions on Education, vol. 4., no 1., pp. 67-75, February 2001

- Elevated to Senior Member of the Institute of Electrical and Electronic Engineers, 2000

- NSF Outstanding Lecturer award: NSF sponsored Applied Optics course, Oakland University, 1995

- Elected Chair IEEE Southeastern MI Signal Processing and Circuits and Systems Chapters, 1993

- Recipient of the most improved Chapter Award - IEEE Southeastern MI Signal Processing and Circuits and Systems Chapters, 1993
- Elected Chair IEEE Southeastern MI Signal Processing and Circuits and Systems Chapters, 1992
- Elected Vice-Chair IEEE Southeastern MI Signal Processing and Circuits and Systems Societies, 1991
- Doctoral Qualification with Honors: Digital Signal Processing, Optimization, Mathematics, 1987
- Oakland University Provost's Full Fellowship, 1986-1989
- General Motors Fellow: graduate studies MIT (Full Fellowship), 1981-1983
- National Merit Letter of Commendation (NSF), 1981
- Engineer of the Year Award, University of Detroit, 1981
- GM Scholar: General Motors Full Undergraduate Scholarship 1977-1981

PROFESSIONAL & HONOR SOCIETY MEMBERSHIP

Senior Member: IEEE Signal Processing Society, IEEE Computational Intelligence Society, IEEE Robotics and Automation Society

Tau Beta Pi, Engineering National Honor Society

Eta Kappa Nu, Electrical Engineering National Honor Society

Alpha Sigma Nu, National Jesuit Honor Society

SELECTED SERVICE

- Member, University Junior/Senior Faculty Mentoring Steering Committee, 2010-present
- Member, University Mission and Identity Steering Committee, 2011-Present
- Member, ECE Department Doctoral Review Committee, 2001-Present
- Elected Member: University Faculty Assembly (inaugural shared governance body), 2005 - 2009
- Member, University Core Curriculum Committee, 1994-2002
- Chair, College of Engineering and Science Promotion and Tenure Committee 1995-2001 (Chair for 3 years)

TEACHING RECORD

The following list provides brief synopses of the courses I have prepared and taught at UDM.

Introductory Microcontrollers and Embedded Systems:
   Microcontroller architecture and operation, assembly and C/C++-language programming, simulation, basic I/O and peripheral interfacing

Introductory Microcontrollers and Embedded Systems Laboratory
   Robot-based projects using mobile or arm-based actuators in combination with multiple sensors and interface protocols.

Embedded Systems :
   Advanced processor architecture, operation, and timing, Advanced interfacing (DAC, ADC, SPI, I2C, SCI, PWM), Advanced Programming (interrupts, real time system events, threads and semaphores, multitasking), Embedded Applications, C/C++ language development.

Embedded Systems Laboratory

Advanced, Audio system, Control, and Robot-based projects using mobile or arm-based actuators in combination with multiple sensors and interface protocols.

Hardware Description Languages: VHDL:

Advanced treatment of digital system design methodology, VHDL design and simulation language (Structural, Data flow, and Behavioral), Simulation and Synthesis construction and demonstration of FPGA based projects

Hardware Description Languages Design Laboratory

Implementation of FPGA-based system designs (e.g. video systems, mp3 encoders, robotic controllers) using Xilinx and Altera hardware systems.

Introductory Logic Design & Laboratory

Combinational and Sequential Logic, PLD's, Simulation and Synthesis of Circuits

Digital System Design II:

Speed, Delay, Fan-out, Memory Systems, Basic System Architectures, Machine Organization, Micro-programming, Intersystem Communication, Peripherals and Interfacing

Electrical Engineering Senior Design I:

Creative and realistic design effort which requires written, oral and visual communication skills as well as teamwork and planning, literature search, detailed feasibility study, and development of multiple design alternatives. For the last 10 years this two semester sequence focused on developing Autonomous Ground Vehicles for competition in the International Ground Vehicle Competition (IGVC)

Electrical Engineering Senior Design II:

Continuation of Design I, formal implementation of the chosen design, extensive hardware building and testing, extensive software debugging and testing, milestone and progress reports, final report/ presentation requirements **Control Theory I**

Probabilistic Robotics:

Linear systems, matrix theory and probability review, kinematics, probabilistic kinematics, least squares estimation, Kalman filtering, extended Kalman filtering, occupancy grid mapping, particle filtering.

Digital Image Processing and Computer Vision:

Image processing and Computer Vision, Image transforms, enhancement, restoration, segmentatio, representation, and interpretation. Extensive Matlab projects

Autonomous Robotics Graduate Seminar

Robot Localization, Navigation, Path Planning and Mapping, Physical robot implementations

Communication Theory I

Signals and Systems

Signal representation and modeling, Continuous and discrete-time signals, Fourier Analysis for continuous and discrete time systems, Sampling and reconstruction, Laplace transform Analysis, Z-Transforms.

Random Variables and Random Processes:

Probability theory review, random variables, random processes, analysis and processing of random signals, Matlab projects

Digital Signal Processing

FE Exam Preparation — Professional World of Work:
The objectives of this course are to increase the student's ability to understand contemporary issues of the engineering profession including professional and ethical responsibility, the impact of engineering solutions in a global social context, and the importance of teamwork. The class also undertakes an extensive review of all ECE topics relevant to the national FE examination which all students take.

Introductory Circuit Theory & Laboratory

PROPOSALS & GRANTS

NSF, Scholarships in Science, Technology, Engineering, and Mathematics Program (S-STEM), Shuvra Das (PI) and Mark J. Paulik (PI), "S-STEM: Scholarships for Robotics and Mechatronics Systems Engineering " (Award No. 1458496), Funded: $593,500, Sept. 2016- August 2021.

Denso Foundation, Mark Paulik (PI), Utayba Mohammad, "Self-Driving Vehicle with Model-In-the-Loop (MIL) simulation of Advanced Driver Assistance Safety Systems ," Funded: $50,000, July 2016-June 2018.

NovAtel Industries, Mark Paulik (PI), Propak-6 DGPS dual-antenna SPAN system grant request: $20,000 equipment donation, March 2017.

Ford Blue Oval Vehicle Team Challenge, Mark Paulik (PI), Utayba Mohammad, University of Detroit Mercy: Intelligent Robotic Vehicle Development, Department of Electrical and Computer Engineering. Funded: $7500, November 2015.

Denso Foundation, Mark Paulik (PI), Utayba Mohammad, "Integrating Dedicated Short Range Communication with Advanced Driver Assistance Systems for Inter-Vehicle and Multi-Agent Safety Applications," Funded: $50,000, July 2014-June 2015.

Denso Foundation, Mark Paulik (PI), Utayba Mohammad, Chaomin Luo, "UDM Multi-Disciplinary Student Project Development for Autonomous Vehicle and Advanced Driver Assistance Systems", Funded $50,000, August 2012-May 2014.

Ford Blue Oval Challenge, Mark Paulik (PI), University of Detroit Mercy: Intelligent Robotic Vehicle Development, Department of Electrical and Computer Engineering. Funded: $2500, December 2013.

KVH Industries, Mark Paulik (PI), KVH-5100 fiber optic three axis IMU grant request: $15,000 equipment donation, March 2013.

Ford Blue Oval Challenge, Mark Paulik (PI), Mohan Krishnan, University of Detroit Mercy: Intelligent Robotic Vehicle Development, Department of Electrical and Computer Engineering. Funded: $2500, December 2012.

TARDEC Computational Simulation & Motion Based Technology Team Engineering Work Directive, WD 0045, Prime Agreement W56HZV-08-C-0236, Mark Paulik (PI), Mohan Krishnan, Chaomin Luo, "Reliable Localization and Navigation of Unmanned Ground Vehicles (UGV's)," Funded: $183,093. April 21, 2011 – December 31, 2012.

DENSO Foundation, Mark Paulik (PI) and Nihad Dukhan, "UDM Multi-Disciplinary Student Project Development For LIDAR Localization and Navigation Systems and Thermal Phase-Change Storage," DENSO North America Foundation, Funded: $50,000, 2009-10.

Mark Paulik (PI) Mohan Krishnan, Nizar Al-Holou (Co-PI), "Cooperative Multi-UGV Mapping and Navigation: Phase II", funded: $100,000, TARDEC Joint Center for Robotics (via GRRC), August 2008 to July 2010.

UDM Entrepreneurship Grant, ECE Department, Mark Paulik (PI), L. Hannifin (Co-PI), Program market evaluation for Masters in Robotics Funded: $40,000.

Mark Paulik (PI) and Mohan Krishnan (Co-PI), "A Real Time DSP Applications Laboratory," Funded: $45,000 2000-2008. Chrysler Foundation.

Mark Paulik (PI) and Mohan Krishnan (Co-PI), "Enhancement of an EE Capstone Design Sequence," Funded: $78,000, 1996-2008. Chrysler Foundation.

Mark Paulik (PI), "Robotics Program Laboratory Development", Chrysler Corporation, Funded: $20,000, 2007-2008.

Mark Paulik (PI), "Development of an Advanced Mobile Robotics Laboratory," Denso Corporation, Funded: $17,500, 2007.

Mark Paulik (PI), Mohan Krishnan and Nizar Al-Holou (Co-PI), "Cooperative Multi-UGV Mapping and Navigation," TARDEC/ARO Battelle: $ 100,000, funded 2007-08.

Mark Paulik, Nizar Al-Holou, and Mohan Krishnan (Co-PIs), "Funding Extension 2007-08: Next Generation Vehicle Network and Sensors for Vehicle Reliability Part II," TARDEC/ARO Battelle: $100,000 (supplemental to existing contract TCN 06164).

Nizar Al-Holou, Mark Paulik and Mohan Krishnan (Co-PIs) "Next Generation Vehicle Network and Sensors for Vehicle Reliability," Tank Automotive Research Development and Engineering Center (TARDEC)/ ARO Battelle, $385,400 October 2006 -- October 2008.

Mark Paulik (PI), "Undergraduate FPGA laboratory instruction using VHDL Phase IV," Altera University Grant Program, $18,000, 2006.

NSF, Implementation Grants for the Department-Level Reform of Undergraduate Engineering Education initiative, $1,000,000. Mark J. Paulik (PI), "A Balanced, Integrated, and Innovative Electrical and Computer Engineering Curriculum," (Recommended for Funding: Proposal No. 0530298 -- insufficient funds), Summer 2005. Grant included in-kind support from FORD PAS program and Utica MI School District.

NSF, Planning Grants for the Department-Level Reform of Undergraduate Engineering Education initiative, Mark J. Paulik (PI), "Development of an Innovative Curriculum for Undergraduate Electrical and Computer Engineering Students" (Proposal No. 0230602), Funded: $100,000, 2003-2005.

Altera, University Grant Program, Mark J. Paulik (PI), "Undergraduate FPGA laboratory instruction using VHDL Phase III," Software Licensing, and Hardware $5000, 2002.

Altera, University Grant Program, M.J. Paulik (PI), "Undergraduate FPGA Laboratory Instruction Using VHDL Phase II," $38,000 Software Licensing, and $11,000 Hardware, 1999.

National Instruments Academic Partnership Program, 1999, Mark Paulik (PI), Mohan Krishnan (Co-PI), "Autonomous Ground Vehicle Development," $11,200 Hardware and Software.

Altera, University Grant Program, January 1997-1998, Mark Paulik (PI), Nizar Al-Holou (Co-PI), "Undergraduate FPGA Laboratory Instruction Using VHDL," $4500 Equipment and Software.

Amigo International, October 1998, Mark Paulik (PI), "Autonomous Ground Vehicle Development," $4000 Vehicle Platform.

"Undergraduate ASIC Computer-Aided Design Laboratory," NSF, CCLI program, Mark Paulik and Nizar Al-Holou (Co-PIs), $56,456, 1996.

"Automatic Target Recognition and Tracking (ATTRACT)," Wright Patterson Air Force Base, Nizar Al-Holou (PI), Mark J. Paulik, $58,000, 1995-1996.

"A Passive Entry System for Automotive Applications," Ford Motor Company, Mark Paulik (PI), C.J. Lin, $40,000, Oct. 1993-May 1995.

"Development of A Plastic Optical Fibre Communication Link for Automotive Applications," Ford Motor Company, Oct. 1993-May 1995, Nizar Al-Holou (PI), Mohan Krishnan, and Mark Paulik, $40,000, Oct. 1993- May 1995.

"Senior Design Laboratory Equipment Proposal," Hewlett Packard Company, University Grants Program, Mark Paulik (PI), $5950.00, July 1991.

"Handwriting Recognition Using a Nonstationary Autoregressive Hidden Markov Model," Federal Mogul Faculty Professional Development Program, M.J. Paulik and Mohan Krishnan (Co-PIs), $1200.00, 1991.

"Automotive Electronics Laboratory Development," Ford Motor Company, $400,000.00, Mark Paulik (PI), James Kent, Arthur Haman (Co-PIs), Dipak Sengupta, 1990-1991.

"Object Boundary Modeling and Analysis," Federal Mogul Faculty Professional Development Program, Mark Paulik (PI), $3500.00, 1990.

"Control System Component Reliability," Ford Motor Company, Transmission and Chassis Division, R. Ashfrazadeh, C.J. Lin, D. Sengupta (Co-PIs), Mark J. Paulik, Mohan Krishnan, $140,000.00, 1989-1990.

PUBLICATIONS

Publications in the Last 8 Years (2008-Present):

1. C. Luo, Simon X. Yang, M. Krishnan, Mark Paulik, "An Effective Vector-driven Biologically-motivated Neural Network Algorithm to Real-time Autonomous Robot Navigation, Proceedings of IEEE International Conference on Robotics and Automation (ICRA'2014), 2014, pp. 4094-4099.

2. C. Luo, S. X. Yang, Mohan Krishnan and Mark Paulik, "Autonomous vehicle navigation and mapping with local minima avoidance paradigm in unknown environments, " Proceedings of IEEE Automation Congress (WAC), pp. 823-828, 2014.

3. C. Luo, Y.T. Wu, Mohan Krishnan, Mark Paulik, G. E. Jan and J. Gao, An Effective Search and Navigation Model to an Auto-Recharging Station of Driverless Vehicles, In Proc. of 2014 IEEE Symposium on Computational Intelligence in Vehicles and Transportation Systems, in IEEE

Symposium Series on Computational Intelligence (SSCI 2014), pp. 100-107, Dec 9-12, 2014, Orlando, Florida, USA.   Dec 9-12, 2014.

4. Cheng-Lung Lee, H., Zhang, H. Nguyen, Y.T. Wu, C. Smalley, U. Mohammad and Mark Paulik, "Multi-Modal Image Segmentation for Obstacle Detection and Masking," Proceedings of the 2014 SAE World Conference, SAE Technical Paper 14B-0352/2014-01-0164, April, 2014.

5. Eyad Zeino, Mark Paulik, Mohan Krishnan, Chaomin Luo, James Overholt, Greg Hudas, Thomas Udvare, "Ground-Truth Localization Using a Sequential-Update Extended Kalman Filter," 2014 IEEE Electro/Information Technology (EIT) Conference, June 5-7 2014.

6. Leonardo Martinez, Mark Paulik, and Mohan Krishnan, "Map-based Lane Identification and Prediction for Autonomous Vehicles," 2014 IEEE Electro/Information Technology (EIT) Conference, June 5-7 2014.

7. C. Luo, Mohan Krishnan, Mark Paulik, S. Fallouh, "An Intelligent Hybrid Behavior Coordination System for an Autonomous Mobile Robot," In proceedings of: SPIE on Intelligent Robots and Computer Vision XXXI: Algorithms and Techniques, San Francisco, Volume: Vol. 9025 90250W-1, February 2014.

8. C. Luo, Mohan Krishnan, Mark Paulik, Gene Eu Jan, "An Effective Trace-Guided Wave-front Navigation and Map Building Approach for Autonomous Mobile Robots," In proceedings of: SPIE on Intelligent Robots and Computer Vision XXXI: Algorithms and Techniques, At San Francisco, Volume: Vol. 9025 90250U-1, February 2014.

9. C. Luo, Mohan Krishnan, Mark Paulik, Bo Cui, Xingzhong Zhang, "A Novel LIDAR-driven Two-level Approach for Real-time Unmanned Ground Vehicle Navigation and Map Building," In proceedings of: SPIE on Intelligent Robots and Computer Vision XXXI: Algorithms and Techniques, At San Francisco, Volume: Vol. 9025 902503-1, February 2014.

10. C. Luo, Simon X. Yang, Mohan Krishnan, Mark Paulik and Yue Chen, "A Hybrid System for Multigoal Navigation and Map Building of an Autonomous Vehicle in Unknown Environments", Proc. of IEEE International Conference on Robotics and Biomimetics (ROBIO'2013), pp. 1288-1233, Dec 2013.

11. Cheng-Lung Lee, Mohan Krishnan, Mark Paulik, and Utayba Mohammad, "A New Trajectory-Based Path Planning Approach for Differential Drive Vehicles," In Proceedings of 2013 IEEE International Symposium on Robotic and Sensors Environments, October 21-23, 2013, Washington DC.

12. Alex Szmatula, M. Parrish, Mohan Krishnan, Mark Paulik, U. Mohammad, C. Luo, "Navigating a Path Delineated by Colored Flags: An Approach for the 2011 IGVC," Proc. SPIE. 8301, Intelligent Robots and Computer Vision XXIX: Algorithms and Techniques 830111, January 22, 2012, San Francisco, CA.

13. C. Luo, Mohan Krishnan, Mark Paulik, Utayba Mohammed, and Qing Wang, "Navigating with VFH: A Strategy to Avoid Traps," Proc. SPIE. 8301, Intelligent Robots and Computer Vision XXIX: Algorithms and Techniques 830111, January 22, 2012, San Francisco, CA.

14. C. Luo, Yue Chen, Mohan Krishnan, Mark Paulik, "The Magic Glove: A Gesture-Based Remote Controller for Intelligent Mobile Robots," Proc. SPIE. 8301, Intelligent Robots and Computer Vision XXIX: Algorithms and Techniques 830111, January 22, 2012, San Francisco, CA.

15. Mahmoud Haidar, Utayba Mohamad, Nizar Al Holou, and Mark J. Paulik, "Service-Oriented Architecture for Wireless Vehicular Communication" Canadian Journal on Multimedia and Wireless Networks, Vol. 1, No. 4, September 2010, pp. 55-74.

16. Mark Paulik, Mohan Krishnan, and Nizar Al-Holou, "Technical Report: UGV Mapping and Navigation", University of Detroit Mercy, Department of Electrical and Computer Engineering, Advanced Mobile Robitics Laboratory, TR:AML002-8.2010, Ground Robotics Reliability Center, University of Michigan, Sponsor Ref. No. W56HZV-04-2-0001, Sub. Contract #3001078040, July 1 2008 -- July 1, 2010, pp. 1-72.

17. Yasser Alnounou, Mark J. Paulik, Mohan Krishnan, Greg Hudas, and James Overholt, "Occupancy Grid Map Merging Using Feature Maps," 15th IASTED International Conference on Robotics and Applications (RA 2010), November 1-3, 2010, Cambridge MA.

18. Yazan Aljeroudi, Mark Paulik, Mohan Krishnan, Chaomin Luo, "A Path Planning Algorithm for Lane-Following-Based Autonomous Mobile Robot Navigation," IS&T/SPIE Electronic Imaging 2010 (aka "Intelligent Robots and Computer Vision XXVII: Algorithms and Techniques"), Jan. 17-21, 2010, San Jose, CA.

19. Jun Chen, Yipeng Tang, Chaomin Luo, Mohan Krishnan, Mark Paulik, "An Enhanced Dynamic Delaunay Triangulation-Based Path Planning Algorithm For Autonomous Mobile Robot Navigation," IS&T/SPIE Electronic Imaging 2010 ("Intelligent Robots and Computer Vision XXVII: Algorithms and Techniques"), Jan. 17-21, 2010, San Jose, CA.

20. Mark J. Paulik, Mohan Krishnan, Shuvra Das, Nizar Al-Holou, AML Technical Report TR: AMRL001-2.2009 (Final Report) TARDEC, "Next Generation Vehicle Network and Sensors for Vehicle Reliability" and "Cooperative Multi-UGV Mapping and Navigation," DAAD19-02-D-0001: TCN 06164 & TCN 06164-4 Scientific Services Program, February 2009.

21. Mohan Krishnan, Mark J. Paulik, Sandra Yost, and Tom Stoltz, "Shared Projects with a Multi-Sub-Disciplinary Flavor - Providing Integration and Context in a New ECE Spiral Curriculum," 2008 IEEE/ASEE Frontiers in Education Conference, Saratoga Springs, NY, October 22-25, 2008.

22. Sandra Yost, Mohan Krishnan, and Mark Paulik, "Development of an Integrated Spiral Curriculum in Electrical and Computer Engineering," 2008 ASEE Annual Conference, Pittsburgh, PA, July 2008.

23. Tarig A. Osman, Mohan Krishnan, and Mark J. Paulik, "A Minimum-Velocity-Based Segmentation Scheme for Improved Performance of an Online Signature Verification System," 2008 IEEE International Conference on Electro/Information Technology, Iowa State University, Ames, IA, May 2008.

24. Mark Paulik, Invited Poster Presentation entitled "Multi-UGV Cooperative Perception, Navigation, and Mapping," Michigan Robotics and Autonomous Technologies Conference, University of Michigan (Ann Arbor), August 11, 2008.

25. Mark Paulik and Mohan Krishnan, "Multi-UGV Cooperative Perception, Navigation, and Mapping," Invited Poster Presentation: Detroit Arsenal Joint Robotics Demonstrations (TARDEC), August 11, 2008.

Refereed Journals and Conference Publications (1987-2007):

26. Jerry Lane, Charles Reinholtz, Sean Baity, Andrew Poulter, Mohan Krishnan, Mark Paulik, and Nassif Rayess, "Articulated and Morphing Unmanned Ground Vehicles Controlled with Complimentary Semi- & Autonomous Mobility Behaviors," NATO Symposium on Platform Innovations and System Integration for Unmanned Air, Land and Sea Vehicles," Florence Italy, May 2007.

27. Tarig A. Osman, Mark J. Paulik and N. Mohankrishnan, "An Online Signature Verification System based on Multivariate Autoregressive Modeling and DTW Segmentation," IEEE SAFE 2007: Signal Processing Applications for Public Security and Forensics, Washington D.C., April 2007.

28. Mohan Krishnan, Mark J. Paulik, and Nassif Rayess, "A Multi-Disciplinary and Multi-Cultural Competition-Based Capstone Design Program," Proceedings of the IEEE/ASEE FIE 2007 Conference, Milwaukee WI, October 10-13, 2007.

29. Mark J. Paulik and Mohan Krishnan, "A Project-Based Spiral Curriculum Incorporating Modern Teaching Paradigms," 5th Annual ASEE Global Colloquium on Engineering Education, Rio de Janeiro, Brazil, October 2006.

30. Robert T. McKeon, Mark Paulik, and Mohan Krishnan, "Lane Identification and Path Planning for Autonomous Mobile Robots," SPIE Optics East 2006, Boston, MA, October 2006.

31. Robert T. McKeon, Mohan Krishnan, and Mark Paulik, "Obstacle Recognition Using Region-Based Color Segmentation Techniques for Mobile Robot Navigation," SPIE Optics East 2006, Boston, MA, October 2006.

32. Faroog Ibrahim, Tom Pilutti, Nizar AlHolou, Mark Paulik, "Accurate INS Position Solution During GPS Outages or Degraded GPS," Journal of Vehicle System Dynamics, Vol. 43, No.9, September 2005, pp. 633-652.

33. Tom Stoltz, Mark Paulik, N. Al-Holou, "A Microcontroller Laboratory Hardware Platform for the Academic Environment," IEEE/ASEE Frontiers in Education Conference, October 2005, Indianapolis, Indiana.

34. Mark Paulik, Mohan Krishnan, and Nizar Al-Holou, "Development of an Innovative Curriculum for Undergraduate Electrical and Computer Engineering Students", IEEE/ASEE Frontiers in Education Conference, October 2004, Savannah, GA.

35. Mohan Krishnan, Shuvra Das, Mark Paulik et. al., "Assessment: When is Enough Enough?," IEEE/ASEE Frontiers in Education Conference, November 5-8, 2003, Boulder, CO.

36. Prasad Venugopal, Mark Paulik and Mohan Krishnan, "EE Capstone Design Projects: Developing Computer-Based Laboratories For Introductory Physics", IEEE/ASEE Frontiers in Education Conference, Nov. 2002, Boston, MA.

37. Mark Paulik and Mohan Krishnan, "A Competition Motivated Capstone Design Course: The Result of a Fifteen Year Evolution," IEEE Transactions on Education, vol 4., no 1., pp. 67-75, February 2001.

38. Mark Paulik, Mohan Krishnan, "An Autonomous Ground Vehicle Competition-Driven Capstone Design Course," Proceedings of the IEEE International Conference on the Frontiers in Education Conference, San Juan, Puerto Rico, November, 1999.

39. Mohan Krishnan, Wan-Suck Lee, Mark Paulik, "A Performance Evaluation of a New Signature Verification Algorithm Using Realistic Forgeries," IEEE International Conference on Image Processing, Japan, November 1999.

40. Faroog Ibrahim, Tom Pilutti, Nizar AlHolou, Mark Paulik, "Accurate Gap Filling Using Properly Initialized INS During Periods of GPS Signal Blockage," Proceedings of the Institute of Navigation (ION) Conference, Nashville, September 1417, 1999.

41. Faroog Ibrahim, Tom Pilutti, Nizar AlHolou, Mark Paulik, "Estimating Biases and Scale Factors in Speed and Yaw Rate Sensors Using a Linear Neuron," Proceedings of the Institute of Navigation (ION) Conference, Nashville, September 1417, 1999.

42. Mark Paulik, Yung-Da Wang, "Three-Dimensional Object Recognition Using Vector Wavelets," Proceedings of the IEEE International Conference on Image Processing, Chicago Ill, October 1998.

43. Wan-Suck Lee, Mohan Krishnan, and M. J. Paulik, "Improved Segmentation Through Dynamic Time Warping for Signature Verification Using a Neural Network," Proceedings of the IEEE International Conference on Image Processing, Chicago Ill, October 1998.

44. M. J. Paulik, Yung-Da Wang, "A Multiwavelet Model for 2-D Object Analysis and Classification," Proceedings of the IEEE Midwest Symposium on Circuits and Systems, Notre Dame IN, August 1998.

45. M. J. Paulik, Mohan Krishnan, and M. Nikiforuk, "Dynamic Stochastic Segmentation of On-Line Signature Contours," Proceedings of the IEEE Midwest Symposium on Circuits and Systems, Iowa , August 1996.

46. Yung-Da Wang, M. J. Paulik, "A Discrete Wavelet Model for Target Recognition," Proceedings of the IEEE Midwest Symposium on Circuits and Systems, Iowa , August 1996.

47. Mohan Krishnan, Wan-Suck Lee, and M. J. Paulik, "Multi-layer Neural Network Classification of On-Line 1-D Signature Contours," Proceedings of the IEEE Midwest Symposium on Circuits and Systems, Iowa , August 1996.

48. Mark Paulik, and Mohan Krishnan, "Teaching Electrical Engineering Design: A Ten Year Summary," Proceedings of the IEEE International Conference on the Frontiers of Education, San Jose, CA, November 1994.

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