

# James M. Conrad, Ph.D., PE, PMP

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## HIGHLIGHTS

- Management experience as Associate Department Chair (UNC Charlotte), Board of Directors (IEEE and FIRST NC), and Project Manager (Ericsson, Sony Ericsson).
- Professor of Electrical and Computer Engineering at the University of North Carolina at Charlotte.
- Licensed Engineer in the State of North Carolina. Certified Project Management Professional (PMI).
- Principal investigator or co-principal investigator of over \$2,500,000 of funding.
- Author or co-author of eight books and over 150 articles and book chapters.
- Member of the Board of Directors of the Institute of Electrical and Electronics Engineering (IEEE) as Region 3 director (2016-2017).
- Member of the Board of Directors of FIRST (For Inspiration of Recognition of Science and Technology) North Carolina Robotics, Inc.
- UNC Charlotte campus director for the NC Space Grant Consortium.

## EDUCATION

**Ph.D.** Electrical And Computer Engineering, North Carolina State University, Raleigh, NC, May 1992.

**M.S.** Electrical and Computer Engineering, North Carolina State University, Raleigh, NC, May 1987.

**B.S.** Computer Science, University of Illinois - Urbana/Champaign, Urbana, IL, May 1984.

## ACADEMIC EXPERIENCE

**University of North Carolina at Charlotte**, Charlotte, NC

Professor, Department of Electrical and Computer Engineering 2013-present

Associate Professor, Department of Electrical and Computer Engineering (tenured in 2007) 2003-2013

Direct the research of graduate students, and manage teams of undergraduate students on projects dealing with embedded systems, microprocessors, wireless and computer communications, robotics and education. Develop and teach graduate and undergraduate classes on the following topics:

- Embedded system development
- Hardware design and microprocessor programming techniques
- Real-time data acquisition and control techniques, sensor interfacing and design
- Robotics systems development

Associate Department Chair and Computer Engineering Curriculum Coordinator 2017-present

Associate Department Chair, Department of Electrical and Computer Engineering 2010-2013

Directed our undergraduate programs; responsible for course scheduling, resource assignment, and basic operation of department. Organizer of work activities for our successful ABET accreditations.

**North Carolina State University**, Raleigh, NC

Adjunct Associate Professor, Department of Electrical and Computer Engineering 2004-2008

Adjunct Assistant Professor, Department of Electrical and Computer Engineering 1996-2003

**University of Arkansas**, Fayetteville, AR (Adjunct faculty in Electrical Engineering)

Assistant Professor, Department of Computer Systems Engineering 1992-1995

**North Carolina State University, Raleigh, NC**

Graduate Assistant/Instructor, Department of Electrical and Computer Engineering 1990-1992

**Wake Technical Community College, Raleigh, NC**

Instructor (part time), Continuing Education Department 1988-1989

**INDUSTRY EXPERIENCE**

**Ericsson and Sony Ericsson Mobile Communications, Inc., Research Triangle Park, NC**

Project Manager, CDMA Consumer Products 1999-2003

Served as Lead Project Manager for several multi-million dollar (\$1.5 to \$30M) CDMA mobile phone products. Directed the development and testing efforts of approximately 150 employees.

Project Manager and Software Team Lead, Enterprise Networks Division 1997-1999

Project manager and test team leader for Ericsson's TDMA business wireless cellular phone products, including handsets, base stations, and control systems for an in-building wireless product.

**BPM Technologies, Greenville, SC**

Senior Software Engineer, Engineering Department, 1996-1997

Manufacturer of a 3-dimensional printer used in the Mechanical Design field. Was responsible for designing and implementing the computer hardware and software architecture for the BPM Personal Modeler. Lead engineer of a multi-discipline design team.

**IBM - Communications Systems, Research Triangle Park, NC**

Senior Associate Programmer, Product Assurance 1984-1990

Worked as Product Assurance and Software/Hardware Test Leader. Developed plans for testing, including employee and hardware assignments. Monitored development and test activities and made assurance assessments and recommendations based on observations. Supervised test team.

**CERTIFICATIONS**

- Professional Engineer: Electrical and Computer: Computer, NC license #036359.
- Project Management Institute, Certified Project Management Professional (PMP).

## RESEARCH

Publishing in the field of Embedded Systems and Engineering Education is emphasized by publishing in refereed conferences in order to present the latest findings into the field quickly. Further publication of these conference papers in journals require the addition of 30-50% of new materials. Therefore much more emphasis is placed on conference publications than journals.

### Dissertation

James M. Conrad, "Parallel Arc Consistency Algorithms for Pre-processing Constraint Satisfaction Problems," Ph.D. Dissertation, Department of Electrical and Computer Engineering, North Carolina State University, Raleigh, NC, April 1992. Advisor: Dharma P. Agrawal.

### Books

1. **James M. Conrad**, *Embedded Systems: An Introduction Using the Renesas RX63N Microcontroller*, ISBN 978-1-935772-94-1, Micrium Press, Weston, FL, 2014. Published electronically.
2. **James M. Conrad**, *An Introduction to Computer Engineering Using the Renesas Sakura Microcontroller Board*, ISBN 978-1-935772-92-7, Micrium Press, Weston, FL, 2014. Published electronically.
3. **James M. Conrad**, *Advanced Embedded Systems Concepts Using the Renesas RX63N Microcontroller*, ISBN 978-1-935772-95-8, Micrium Press, Weston, FL, 2014. Published electronically.
4. Alexander G. Dean and **James M. Conrad**, *Creating Fast, Responsive and Energy-efficient Embedded Systems Using the Renesas RL78N Microcontroller*, ISBN 978-1-935772-98-9, 388 pages, Micrium Press, Weston, FL, 2012.
5. **James M. Conrad** and Alexander G. Dean, *Embedded Systems: An Introduction Using the Renesas RX62N Microcontroller*, ISBN 978-1-935772-99-6, 526 pages, Micrium Press, Weston, FL, 2011.
6. **James M. Conrad**, *Stiquito(tm) Controlled!*, ISBN 0-4714-8882-8, 191 pages, Wiley Books and IEEE Computer Society Press: Los Alamitos, CA, 2005.
7. **James M. Conrad** and Jonathan W. Mills, *Stiquito(tm) for Beginners: An Introduction to Robotics*, ISBN 0-8186-7514-4, 192 pages, Wiley Books and IEEE Computer Society Press: Los Alamitos, CA, 1999.
8. **James M. Conrad** and Jonathan W. Mills, *Stiquito(tm): Advanced Experiments with a Simple and Inexpensive Robot*, ISBN 0-8186-7408-3, 328 pages, Wiley Books and IEEE Computer Society Press: Los Alamitos, CA, 1997.

### Book Chapters

1. **James M. Conrad** and Jonathan W. Mills, "The History and Future of Stiquito, a Hexapod Insectoid Robot," in *Artificial Life Models in Hardware*, Andy Adamatzky, Editor, Springer: London, 2009.
2. David A. Andrews, Mitch A. Thornton, **James M. Conrad**, and Michael D. Glover, "Computer-Aided Engineering and Design," in *Advanced Electronic Packaging: With Emphasis On Multi-Chip Modules*, editor William D. Brown, IEEE Press: New York, NY, 1999.

### Refereed Journal Articles

1. **James M. Conrad**, Drew Polly, Ian Binns, and Bob Algozzine, "Student Perceptions of a Summer Robotics Camp Experience", *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, pp. 1-9, 2018. doi: 10.1080/00098655.2018.1436819.
2. Aidan F. Browne and **James M. Conrad**, "A Versatile Approach for Teaching Autonomous Robot Control to Multi-disciplinary Undergraduate and Graduate Students," *IEEE Access*, Vol. PP, Issue 99, March 30, 2017.
3. Ian C. Binns, Drew Polly, **James M. Conrad**, and Bob Algozzine, "Student perceptions of a summer ventures in science and mathematics camp experience," *School Science and Mathematics*, 116(8), 420-429, 2016. doi:10.1111/ssm.12196.
4. Ivan Howitt, Wayne Manges, Teja Kuruganti, Glenn Allgood, Jose Gutierrez, **James M. Conrad**, "Wireless Industrial Sensor Networks: Framework for QoS Assessment and QoS Management," *Transactions of the Instrumentation, Systems, and Automation Society (ISA)*, pp. 347-359, vol. 45, no. 3, July 2006.
5. **James M. Conrad** and Ivan Howitt, "Introducing Students to Communications Concepts Using Optical and Low-Power Wireless Devices," invited paper to the journal *Elektrik: Special Issue on Electrical and Computer Engineering Education in the 21st Century: Issues, Perspectives and Challenges*, pp. 55-66, vol. 14, no. 1, March 2006.
6. **James M. Conrad**, "Stiquito for Robotics and Embedded Systems Education," *IEEE Computer Magazine*, vol. 38, no. 6, pp. 77-81, June 2005.
7. **James M. Conrad** and Dharma P. Agrawal, "Asynchronous Parallel Arc Consistency Algorithms on a Distributed Memory Machine," *Journal of Parallel and Distributed Computing*, Vol. 24, No. 1, pp. 27-40, January 1995.
8. **James M. Conrad** and Dharma P. Agrawal, "Simulation of Generic Multiprocessor Configurations for Asynchronous Algorithms," *International Journal in Computer Simulation, Special Issue on Multiprocessor Networks*, Vol. 3, No. 2, pp. 147-164, 1993.

### Refereed Conference Articles

1. Benjamin B. Rhoades, and **James M. Conrad**, "A Novel Terrain Topology Classification and Navigation for an Autonomous CAN Based All-Terrain Vehicle", *Proceedings of the 2018 IEEE SoutheastCon*, St. Petersburg, FL, April 2018.
2. Benjamin B. Rhoades, Vinit Katariya, and **James M. Conrad**, "A Novel RF (XBee) and IR LoS (Line-of-Sight) Collaborative Vehicle-to-Vehicle Navigation Technique", *Proceedings of the 2018 IEEE SoutheastCon*, St. Petersburg, FL, April 2018.
3. Benjamin B. Rhoades, Disha Srivastava, and **James M. Conrad**, "Design and Development of a ROS Enabled CAN Based All-Terrain Vehicle Platform", *Proceedings of the 2018 IEEE SoutheastCon*, St. Petersburg, FL, April 2018.
4. Mukul A. Gosavi, Benjamin B. Rhoades, and **James M. Conrad**, "Application of Functional Safety in Autonomous Vehicles Using ISO 26262 Standard: A Survey", *Proceedings of the 2018 IEEE SoutheastCon*, St. Petersburg, FL, April 2018.
5. Jaydeep Kshigar, Sam Shue and **James M. Conrad**, "A Survey of Implementation of Multi-Robot Simultaneous Localization and Mapping", *Proceedings of the 2018 IEEE SoutheastCon*, St. Petersburg, FL, April 2018.

6. Sunny Arokia Swamy Bellary, Nelyadi S. Shetty, Ryan C. Hill, Thomas P. Weldon, **James M. Conrad**, "Investigation of a Digital Non-Foster RC Circuit Using Pade and Prony Approximations", *Proceedings of the 2018 IEEE SoutheastCon*, St. Petersburg, FL, April 2018.
7. Aishwarya A. Panchpor, Sam L. Shue and **James M. Conrad**, "A Survey of Methods for Mobile Robot Localization and Mapping in Dynamic Indoor Environments", *Proceedings of the 2018 IEEE Conference on Signal Processing and Communication Engineering Systems*, Vijayawada, India, pp. 138-144, January 2018.
8. **James M. Conrad**, A'lishia Bowman, Henrique Weh, Tomas Ortiz, Grayson Randall, Mary Ellen Randall, and Gregg Vaughn, "The IEEE Modular MOVE Disaster Relief Project," *Proceedings of the 2017 IEEE Global Humanitarian Technology Conference (GHTC)*, San Jose, CA, pp. 327-332, October 2017.
9. **James M. Conrad**, Mary Ellen Randall, Percy Shadwell, Gregg Vaughn, and Grayson Randall, "The IEEE MOVE Disaster Relief Vehicle: Lessons Learned from One Year of Operation," *Proceedings of the 2017 IEEE Global Humanitarian Technology Conference (GHTC)*, San Jose, CA, pp. 333-340, October 2017.
10. Lauren E. Johnson, Nabila BouSaba, and **James M. Conrad**, "The Validity of Technologies in Education: A Survey of Early Childhood Education Developmental Tools," *Proceedings of the 2017 ASEE Conference*, Columbus, OH, June 2017.
11. Sam L. Shue and **James M. Conrad**, "Procedurally Generated Environments for Simulating RSSI-Localization Applications," *Proceedings of the 2017 Spring Simulation Multi-Conference*, Virginia Beach, VA, April 2017, 11 pages.
12. Benjamin B. Rhoades, Jeremy P. Sabo, and **James M. Conrad**, "Enabling a National Instruments DaNI 2.0 Robotic Development Platform for the Robot Operating System," *Proceedings of the 2017 IEEE SoutheastCon*, Charlotte, NC, March 2017.
13. Balasubramanian Chandrasekaran, Shruti Gangadhar, and **James M. Conrad**, "A Survey of Multisensor Fusion Techniques, Architectures and Methodologies," *Proceedings of the 2017 IEEE SoutheastCon*, Charlotte, NC, March 2017.
14. Sam Shue, Lauren E. Johnson, and **James M. Conrad**, "Utilization of XBee ZigBee Modules and MATLAB for RSSI Localization Applications," *Proceedings of the 2017 IEEE SoutheastCon*, Charlotte, NC, March 2017.
15. Tyler C. Major and **James M. Conrad**, "The Effects of Pre-Filtering and Individualizing Components for Electroencephalography Neural Network Classification," *Proceedings of the 2017 IEEE SoutheastCon*, Charlotte, NC, March 2017.
16. Benjamin B. Rhoades and **James M. Conrad**, "A Survey of Alternate Methods and Implementations of an Intelligent Transportation System," *Proceedings of the 2017 IEEE SoutheastCon*, Charlotte, NC, March 2017.
17. Balasubramanian Chandrasekaran and **James M. Conrad**, "Achieving Human Interaction and Maximum Coverage During an Autonomous Robotic Vehicle Navigation of an Unknown Terrain," *Proceedings of the AAI-17 Workshop: Human-Aware Artificial Intelligence (AAI-17)*, San Francisco, CA, pp. 614-620, February 2017.
18. **James M. Conrad**, Mary Ellen Randall, Percy Shadwell, Gregg Vaughn, and Grayson Randall, "Development and Deployment of the IEEE MOVE Emergency Relief Vehicle," *Proceedings of the 2016 IEEE Global Humanitarian Technology Conference (GHTC)*, Seattle, WA, pp. 255-260, October 2016.

19. Grayson Randall, **James M. Conrad**, Gregg Vaughn, Mary Ellen Randall, and Percy Shadwell, "Technical Capabilities of the IEEE MOVE Emergency Relief Vehicle," *Proceedings of the 2016 IEEE Global Humanitarian Technology Conference (GHTC)*, Seattle, WA, pp. 261-265, October 2016.
20. Sam L. Shue and **James M. Conrad**, "Reducing the Effect of Signal Multipath Fading in RSSI-Distance Estimation using Kalman Filters," *Proceedings of the 2016 Spring Simulation Multi-Conference*, Pasadena, CA, April 2016. **Best Paper Award.**
21. Balasubramanian Chandrasekaran and **James M. Conrad**, "Sensor Fusion Using a Selective Sensor Framework to Achieve Decision and Task Execution," *Proceedings of the 2016 IEEE SoutheastCon*, Norfolk, VA, April 2016.
22. Tyler C. Major, Kona Pranay Shekhar, **James M. Conrad**, and Thomas P. Weldon, "Simulation and Measurement of an Internet of Things Implementation of a Programmable Digital Inductor," *Proceedings of the 2016 IEEE SoutheastCon*, Norfolk, VA, April 2016.
23. Gautam Anand Korikar, Sanjay Krishna Katragadda, Sandesh Kesarla, **James M. Conrad** and Aidan F. Browne, "A Survey on Robot Localization in Extraterrestrial Environments," *Proceedings of the 2016 IEEE SoutheastCon*, Norfolk, VA, April 2016.
24. Balaji Masanamuthu Chinnathurai, Ramkrishna Sivakumar, Sushuruth Sadagopan, and **James M. Conrad**, "Design and Implementation of a Semi-Autonomous Waste Segregation Robot," *Proceedings of the 2016 IEEE SoutheastCon*, Norfolk, VA, April 2016.
25. **James M. Conrad**, Margaret S. Harkins, D. Bruce Taylor, Jonathan Mayhorn, and Jeff Raquet, "Prospect for Success in Engineering: Assessing Freshmen Curriculum Engagement," *Proceedings of the Seventh Annual First Year Engineering Experience (FYEE) Conference*, Blacksburg, VA, pp. M4C-1-6, August 2015.
26. Nabila BouSaba and **James M. Conrad**, "Promoting Entrepreneurial Skills through Senior Design Projects," *Proceedings of the 2015 ASEE Conference*, Seattle, WA, June 2015.
27. Balasubramanian Chandrasekaran and **James M. Conrad**, "Human-Robot Collaboration: A Survey," *Proceedings of the 2015 IEEE SoutheastCon*, Ft. Lauderdale, FL, April 2015.
28. Tanmay U. Sane, Sam L. Shue, and **James M. Conrad**, "Implementation of Dynamic Source Routing using 802.15.4 on XBee Series 1 Modules," *Proceedings of the 2015 IEEE SoutheastCon*, Ft. Lauderdale, FL, April 2015.
29. Tyler C. Major, Benjamin B. Rhoades, and **James M. Conrad**, "A Novel and Affordable Robot Kit for Completion of the Requirements for the Boy Scouts of America Robotics Merit Badge," *Proceedings of the 2015 IEEE SoutheastCon*, Ft. Lauderdale, FL, April 2015.
30. Pranay Shekhar Kona, Prasad V. Iyengar, and **James M. Conrad**, "Algorithm-Based, Single Axis Rotation of a Solar Panel Apparatus for Low Power Devices," *Proceedings of the 2015 IEEE SoutheastCon*, Ft. Lauderdale, FL, April 2015.
31. Sam L. Shue and **James M. Conrad**, "Development of a Portable XBee C Library and RSSI Triangulation Localization Framework," *Proceedings of the 2014 11th International Conference on High Capacity Optical Networks and Enabling Technologies (HONET-CNS)*, Charlotte, NC, pp. 125-128, December 2014.
32. Audrow J. Nash, Terrill E. Massey, Christopher J. Wesley, Saketh Simha Kosanam, and **James M. Conrad**, "Towards Establishing and Maintaining Autonomous Quadrotor Formations," *Proceedings of the 11th International Conference on Informatics in Control, Automation and Robotics (ICINCO)*, Vienna, Austria, vol. 2, pp. 634-639, September 2014.

33. Nabila BouSaba, Jean Coco, **James M. Conrad**, Robert Cox, and Mehdi Miri, "Improving Oral Presentation in the Electrical and Computer Engineering Department: A Four Course Study," *Proceedings of the 2014 ASEE Conference*, Indianapolis, IN, June 2014.
34. Nabila BouSaba and **James M. Conrad**, "Recent Graduates' Perspectives on Innovation and Entrepreneurship and the Creation of a New Entrepreneurship Course," *Proceedings of the 2014 ASEE Conference*, Indianapolis, IN, June 2014.
35. Adam C. Harris and **James M. Conrad**, "Utilizing Middleware to Interface with the Simulation Environment for Autonomous Robots," *Proceedings of the 2014 IEEE SoutheastCon*, Lexington, KY, March 2014.
36. Joshua R. Henderson, **James M. Conrad**, and Craig Pavlich, "Using a CAN Bus for Control of an All-Terrain Vehicle," *Proceedings of the 2014 IEEE SoutheastCon*, Lexington, KY, March 2014.
37. Sultana Alimi, Sam Shue, and **James M. Conrad**, "Design and Implementation of an Open-Source Wireless Sensor Network Development Platform," *Proceedings of the 2014 IEEE SoutheastCon*, Lexington, KY, March 2014. **Best Paper Award**.
38. Audrow J. Nash, Cory M. Engel, and **James M. Conrad**, "Establishing and Maintaining Formations of Mini Quadrotors," *Proceedings of the 2014 IEEE SoutheastCon*, Lexington, KY, March 2014.
39. Tyler C. Major and **James M. Conrad**, "A Survey of Brain Computer Interfaces and Their Applications," *Proceedings of the 2014 IEEE SoutheastCon*, Lexington, KY, March 2014.
40. Keith B. Hunter, **James M. Conrad**, and Andrew R. Willis, "Visible Light Communication Using a Digital Camera and an LED Flashlight," *Proceedings of the 2014 IEEE SoutheastCon*, Lexington, KY, March 2014.
41. Adam C. Harris and **James M. Conrad**, "Improving and Designing Sensors for the Simulation Environment for Autonomous Robots (SEAR)," *Proceedings of the 2013 IEEE SoutheastCon*, Jacksonville, FL, March 2013.
42. Anthony Harris, Jason Anderson, **James M. Conrad**, Robert Cox, and Asis Nasipuri, "Internal Characterization of Alkaline Batteries Using Impedance Spectroscopy for Parameter Identification," *Proceedings of the 2013 IEEE SoutheastCon*, Jacksonville, FL, March 2013.
43. Sam L. Shue and **James M. Conrad**, "Robotic Applications in Wireless Sensor Networks," *Proceedings of the 2013 IEEE SoutheastCon*, Jacksonville, FL, March 2013.
44. Gopinath Shanmuga Sundaram, Bhanuprasad Patibandala, Harish Santhanam, Sindhura Gaddam, Vamsi Krishna Alla, Gautham Ravi Prakash, Shiva Chaitanya Vishwakarma Chandracha, Sindhu Boppana and **James M. Conrad**, "Bluetooth Communication using a Touchscreen Interface with the Raspberry Pi," *Proceedings of the 2013 IEEE SoutheastCon*, Jacksonville, FL, March 2013.
45. Peter Schmidt and **James M. Conrad**, "Capstone 101: A Framework for Implementation of an ABET-Compliant Capstone Sequence," *Proceedings of the 2012 ASEE Conference*, San Antonio, June 2012.
46. Anthony Harris, Jacob Davis, Jessica Meeks, Tracie Monfort and **James M. Conrad**, "Concept for a Pipe-Traversing Robot," *Proceedings of the 2012 IEEE SoutheastCon*, Orlando, FL, March 2012.
47. Paul Infant Teenu Mohan Das, Suraj Swami and **James M. Conrad**, "An Algorithm for Landing a Quadrotor Unmanned Aerial Vehicle on an Oscillating Surface," *Proceedings of the 2012 IEEE SoutheastCon*, Orlando, FL, March 2012.
48. Shweta Gupte, Paul Infant Teenu Mohan Das and **James M. Conrad**, "A Survey of Quadrotor Unmanned Aerial Vehicles," *Proceedings of the 2012 IEEE SoutheastCon*, Orlando, FL, March 2012.

49. Alex Cortner, **James M. Conrad**, and Nabila A. BouSaba, "Autonomous All-Terrain Vehicle Steering," *Proceedings of the 2012 IEEE SoutheastCon*, Orlando, FL, March 2012.
50. Vikram S. Gill, Adam C. Harris, Suraj G. Swami and **James M. Conrad**, "Design, Development and Validation of Sensors for a Simulation Environment for Autonomous Robots," *Proceedings of the 2012 IEEE SoutheastCon*, Orlando, FL, March 2012.
51. Sam L. Shue, Claude Hargrove and **James M. Conrad**, "Low Cost Semi-autonomous Sentry Robot," *Proceedings of the 2012 IEEE SoutheastCon*, Orlando, FL, March 2012.
52. Nabila A. BouSaba, **James M. Conrad** Claude M. Hargrove and Valentina Cecchi, "Keys to Success in the IEEE Hardware Competition," *Proceedings of the 2011 ASEE Conference*, Vancouver, BC, pp. 22.990.1-22.990.18, June 2011.
53. Aswin Ramakrishnan and **James M. Conrad**, "Analysis of Floating Point Operations in Microcontrollers," *Proceedings of the 2011 IEEE SoutheastCon*, Nashville, TN, pp. 97-100, March 2011.
54. Adam C. Harris and **James M. Conrad**, "Survey of Popular Robotics Simulators, Frameworks, and Toolkits," *Proceedings of the 2011 IEEE SoutheastCon*, Nashville, TN, pp. 243-249, March 2011.
55. Sunil Kumar Gurram and **James M. Conrad**, "Implementation of CAN bus in an autonomous All-Terrain Vehicle," *Proceedings of the 2011 IEEE SoutheastCon*, Nashville, TN, pp. 250-254, March 2011.
56. Onkar N. Raut, **James M. Conrad**, and Andrew Willis, "Survey of Recognition of Arabic Scripts for Indoor Unmanned Aerial Vehicles using Classical Methods for Pattern Recognition," *Proceedings of the 2011 IEEE SoutheastCon*, Nashville, TN, pp. 255-259, March 2011.
57. Asis Nasipuri, Robert Cox, **James M. Conrad**, Luke Van der Zel, Bienvenido Rodriguez, Ralph McKosky, and Joseph Graziano, "Design Considerations for a Large-Scale Wireless Sensor Network for Substation Monitoring," *The 5th IEEE International Workshop on Practical Issues In Building Sensor Network Applications (SenseApp 2010)*, Denver, Co, pp. 866-873, October 2010.
58. **James M. Conrad**, "NASA Senior Design: Systems Engineering and Reusable Avionics," *Proceedings of the 2010 ASEE Conference*, Louisville, KY, June 2010.
59. Benjamin Levine, Ivan Howitt, and **James M. Conrad**, "Embedded Wireless Networks Laboratory Instruction," *Proceedings of the 2010 ASEE Conference*, Louisville, KY, June 2010.
60. Nabila BouSaba, **James M. Conrad**, G. Bruce Gehrig, Daniel Hoch, William Heybruck, Martin Kane, Peter Schmidt, and Deborah Sharer, "Successes of an Early Conceptual Design Presentation for Senior Design Projects," *Proceedings of the 2010 ASEE Conference*, Louisville, KY, June 2010.
61. Peter Schmidt, Deborah Sharer Nabila BouSaba, Daniel Hoch, **James M. Conrad**, G. Bruce Gehrig, and Steve Patterson, "A Simplified Documentation Control System for use with a Capstone Senior Design Program," *Proceedings of the 2010 ASEE Conference*, Louisville, KY, June 2010.
62. Jiang Guo, Jose M. Macias, **James M. Conrad**, Jimmy Hoo, Rony Velasquez, Maxim Fastovsky, and SaeRom Hong "NASA Senior Design: Mission Assurance Management Environment," *Proceedings of the 2010 ASEE Conference*, Louisville, KY, June 2010.
63. Deborah Sharer, Nabila BouSaba, **James M. Conrad**, G. Bruce Gehrig, Daniel Hoch, William Heybruck, Martin Kane, and Peter Schmidt, "Implementation of a Capstone Senior Design Program Using Open Source Course Management Software," *Proceedings of the 2010 Capstone Design Conference*, Boulder, CO, June 2010.
64. Adam Harris and **James M. Conrad**, "Hybrid Control of a Simple Walking Autonomous Robot," *Proceedings of the 2010 IEEE SoutheastCon*, Charlotte, NC, pp. 420-423, March 2010.



65. Kristen Reband, Melinda Dees, and **James M. Conrad**, "Robot Muscles in a Subzero Temperature Environment," *Proceedings of the 2010 IEEE SoutheastCon*, Charlotte, NC, pp. 73-76, March 2010.
66. Sami M. Lasassmeh and **James M. Conrad**, "Time Synchronization in Wireless Sensor Networks: A Survey," *Proceedings of the 2010 IEEE SoutheastCon*, Charlotte, NC, pp. 242-245, March 2010.
67. Suraj G. Swami, Onkar N. Raut, Ipsita Acharya, and **James M. Conrad**, "A Wireless Quiz System using Low Power Microcontrollers," *Proceedings of the 2010 IEEE SoutheastCon*, Charlotte, NC, pp. 21-24, March 2010.
68. Kailash Toshniwal and **James M. Conrad**, "A Web-based Sensor Monitoring System on a Linux-based Single Board Computer Platform," *Proceedings of the 2010 IEEE SoutheastCon*, Charlotte, NC, pp. 371-374, March 2010.
69. Richard A. McKinney, Malcolm J. Zapata, **James M. Conrad**, Thomas W. Meiswinkel, Siddharth Ahuja, "Components of an Autonomous All-terrain Vehicle," *Proceedings of the 2010 IEEE SoutheastCon*, Charlotte, NC, pp. 416-419, March 2010.
70. Rohit Kale, Nripendra Singh, Hadi Alasti, Asis Nasipuri, Robert Cox, **James M. Conrad**, Luke Van der Zel, Bienvenido Rodriguez, Ralph McKosky, and Joseph Graziano, "Design and Implementation of a Wireless Node for Advanced Sensor Processing and Network Integration," *Proceedings of the 2010 IEEE SoutheastCon*, Charlotte, NC, pp. 390-393, March 2010.
71. Asis Nasipuri, Hadi Alasti, Priya Puthran, Robert Cox, **James M. Conrad**, Luke Van der Zel, Bienvenido Rodriguez, Ralph McKosky, and Joseph Graziano, "Vibration Sensing for Equipment's Health Monitoring in Power Substations Using Wireless Sensors," *Proceedings of the 2010 IEEE SoutheastCon*, Charlotte, NC, pp. 268-271, March 2010.
72. Zhe Dang, Ivan Howitt, Richard McKinney, **James M. Conrad**, "First and Second Order Statistics Analysis for the RSS Measurement in an Indoor Environment," *Proceedings of the 2010 IEEE SoutheastCon*, Charlotte, NC, pp. 298-301, March 2010.
73. Andrew Willis, Malcolm Zapata and **James M. Conrad**, "Linear Methods for Calibrating LIDAR-and-Camera Systems," *Proceedings of 17th Annual Meeting of the IEEE/ACM International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems*, Kensington, London, UK, pp. 577-579, September 2009.
74. Sharayu Ghangrekar and **James M. Conrad**, "Modeling and Simulating a Path Planning and Obstacle Avoidance Algorithm for an Autonomous Robotic Vehicle," *Proceedings of 17th Annual Meeting of the IEEE/ACM International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems*, Kensington, London, UK, pp. 580-582, September 2009.
75. **James M. Conrad**, Nabila BouSaba, Daniel Hoch, William Heybruck, Peter Schmidt, and Deborah Sharer, "Assessing Senior Design Project Deliverables," *Proceedings of the 2009 ASEE Conference*, Austin, TX, June 2009.
76. Peter Schmidt, **James M. Conrad**, Daniel Hoch, William Heybruck, Martin Kane, Deborah Sharer, and Linda Thurman, "Student Evaluations of Sponsor Interaction in a Capstone Interdisciplinary Senior Design Program," *Proceedings of the 2009 ASEE Conference*, Austin, TX, June 2009.
77. G. Bruce Gehrig, Lyndon Abrams, Deborah Bosley, **James M. Conrad**, and Stephen Kuyath, "The TECT Workshop: Raising High School Teachers and Guidance Counselor Self-Efficacy in Counseling Students about Engineering Careers and Majors," *Proceedings of the 2009 ASEE Conference*, Austin, TX, June 2009.

78. Jesse Bikman, Thomas Meiswinkel, and **James M. Conrad**, "An Implementation of a Color Following System using the CMUcam3," *Proceedings of the 2009 IEEE SoutheastCon*, Atlanta, GA, pp. 30-33, March 2009.
79. **James M. Conrad**, Daniel Hoch, William Heybruck, Peter Schmidt, Martin Kane, Linda Thurman, and Frank Skinner, "Working with Industry Sponsors in a Multidisciplinary Senior Design Program," *Proceedings of the 2008 ASEE Conference*, Pittsburgh, PA, June 2008.
80. Andrew Willis and **James M. Conrad**, "Senior Design Project: A Robotic System Using Stereoscopic Cameras for Navigation," *Proceedings of the 2008 ASEE Conference*, Pittsburgh, PA, June 2008.
81. Andrew Willis and **James M. Conrad**, "Design of Intelligent Spacecraft: An Interdisciplinary Engineering Education Course," *Proceedings of the 2008 ASEE Conference*, Pittsburgh, PA, June 2008.
82. Malcolm J. Zapata, William J. Haynes, Nicholas Kannen, Megan Sullivan, and **James M. Conrad**, "An Autonomous Vehicle for Space Exploration," *Proceedings of the 2008 IEEE SoutheastCon*, Huntsville, AL, pp. 15-20, April 2008.
83. Jerry J. Zacharias, Malcolm Zapata, and **James M. Conrad**, "Environment Monitoring with Sensors for Autonomous Vehicles," *Proceedings of the 2008 IEEE SoutheastCon*, Huntsville, AL, pp. 21-26, April 2008.
84. Gajendra Singh and **James M. Conrad**, "Easy-to-Use Communication Interfaces for Data Acquisition," *Proceedings of the 2008 IEEE SoutheastCon*, Huntsville, AL, pp. 111-116, April 2008.
85. Sravanthi Chalasani and **James M. Conrad**, "A Survey of Energy Harvesting Sources," *Proceedings of the 2008 IEEE SoutheastCon*, Huntsville, AL, pp. 442-447, April 2008.
86. Bruce Gehrig, Lyndon Abrams, Deborah Bosley, **James M. Conrad**, and Steven Kuyath, "Addressing the Demand for Engineers by Teaching Engineering to Counselors and Teachers," *Proceedings of the 2007 IEEE Meeting the Growing Demand for Engineers and Their Educators 2010-2020 International Summit*, Munich, Germany, November 2007.
87. **James M. Conrad**, Daniel Hoch, and Frank Skinner, "Student Deliverables and Instruction for a Senior Design Program Course," *Proceedings of the 2007 ASEE Conference*, Honolulu, HI, June 2007.
88. Yesim Sireli, **James M. Conrad**, Martin Kane, and Frank Skinner "Contribution of Engineering Management and Systems Engineering Concepts to Engineering Design," *Proceedings of the 2007 ASEE Conference*, Honolulu, HI, June 2007.
89. Bruce Gehrig, Lyndon Abrams, Deborah Bosley, **James M. Conrad**, and Steven Kuyath, "Expanding Engineering Diversity by Teaching Engineering to Counselors and Teachers," *Proceedings of the 2007 ASEE Conference*, Honolulu, HI, June 2007.
90. Sonia Thakur and **James M. Conrad**, "An Embedded Linux Based Navigation System for an Autonomous Underwater Vehicle," *Proceedings of the 2007 IEEE SoutheastCon*, Richmond, VA, pp. 237-242, March 2007.
91. Brian Newberry and **James M. Conrad**, "Data Logging Solution for Digital Signal Processors," *Proceedings of the 2007 IEEE SoutheastCon*, Richmond, VA, pp. 247-252, March 2007.
92. Jerry Zacharias and **James M. Conrad**, "A Survey of Digital Signal Processing Education," *Proceedings of the 2007 IEEE SoutheastCon*, Richmond, VA, pp. 322-327, March 2007.

93. Venkat Dronamraju, Gurunath Athalye and **James M. Conrad**, "A Stepper Motor and Serial Communication Interface Daughter Board for Educational Use," *Proceedings of the 2007 IEEE SoutheastCon*, Richmond, VA, pp. 328-332, March 2007.
94. Chaitanya Misal and **James M. Conrad**, "Designing a pH Data Acquisition and Logging Device using an Inexpensive Microcontroller," *Proceedings of the 2007 IEEE SoutheastCon*, Richmond, VA, pp. 217-220, March 2007.
95. **James M. Conrad** and Ivan Howitt, "Introducing Project Management Skills to Students Conducting Research," *Proceedings of the 2006 International Conference on Engineering Education*, San Juan, PR, pp. T4D-21 to 25, July 2006.
96. Ishfan Vakil and **James M. Conrad**, "Embedded Systems Communication Board for Education and Research," *Proceedings of the 2006 International Conference on Engineering Education*, San Juan, PR, pp. T3G-25 to 29, July 2006.
97. **James M. Conrad**, "Determining How to Teach Project Management Concepts to Engineers," *Proceedings of the 2006 ASEE Conference*, Chicago, IL, June 2006.
98. Ishfan Vakil and **James M. Conrad**, "Design of a Data Communications Hub for use in Research and Education," *Proceedings of the 2006 IEEE SoutheastCon*, Memphis, TN, pp. 98-103, March 2006.
99. Gurudat Mysore, Brian Newberry and **James M. Conrad**, "A Microcontroller-Based Bed-of-Nails Test Fixture to Program and Test Small Printed Circuit Boards," *Proceedings of the 2006 IEEE SoutheastCon*, Memphis, TN, pp. 104-107, March 2006.
100. Ivan Howitt, Rogelio Neto, Jing Wang, and **James M. Conrad**, "Extended Energy Model for the Low Rate WPAN," *Proceedings of the 2<sup>nd</sup> IEEE International Conference on Mobile Ad-Hoc and Sensor Systems*, Washington DC, pp. 315-322, November 2005.
101. **James M. Conrad** and Yesim Sireli, "Learning Project Management Skills in Senior Design Courses," *Proceedings of the 2005 Frontiers in Education Conference*, Indianapolis, IN, pp. F4D-1 to 6, October 2005.
102. **James M. Conrad**, Sami Lasassmeh, Ishfan Vakil, and Benjamin Levine, "Teaching Optical Communications Concepts in Embedded Systems Courses," *Proceedings of the 2005 Frontiers in Education Conference*, Indianapolis, IN, pp. T4C-28 to 33, October 2005.
103. Andrew McClain and **James M. Conrad**, "Software Design of the Stiquito Micro Robot," *Proceedings of the 2005 IEEE SoutheastCon*, Ft. Lauderdale, FL, pp. 143-147, April 2005.
104. Gajendra Singh and **James M. Conrad**, "Introducing Students to Ultrasonics and its Application in Robotics," *Proceedings of the 2005 IEEE SoutheastCon*, Ft. Lauderdale, FL, p.687, April 2005. (Abstract only)
105. **James M. Conrad**, "Introducing Students to the Concept of Embedded Systems," *Proceedings of the 2004 International Conference on Engineering Education*, Gainesville, FL, October 2004.
106. **James M. Conrad** and Ivan Howitt, "Software and Hardware Tools for Teaching Communications Concepts and Introducing Students to Low-Power Wireless Communications," *Proceedings of the 2004 International Conference on Engineering Education*, Gainesville, FL, October 2004.
107. **James M. Conrad**, Deborah Plummer, Jan Bailey, Mike Williams, Richard Thayer and Ted Lewis, "Authoring A Professional Book," *Proceedings of the 2003 Frontiers in Education Conference*, Boulder, CO, p. FIG-1, November 2003.
108. **James M. Conrad**, "A Hands-On Approach For K-12: Getting Industry Involved," *Proceedings of the 2002 Frontiers in Education Conference*, Boston, MA, pp. F2C-1 to 4, November 2002.

109. **James M. Conrad** “Stuffing More Learning into the Computer Engineering Curriculum Bag: Capstone Course Preparation,” *Proceedings of the 2002 Frontiers in Education Conference*, Boston, MA, pp. F3D-20 to 23, November 2002.
110. **James M. Conrad** and Santosh Kolenchery, “Wireless Phones, GPS and Data Applications” *Proceedings of the 6th International Conference On Information Systems Analysis And Synthesis (ISAS 2000)*, Orlando, FL, Vol. VII, pp. 74-79, July 2000.
111. **James M. Conrad**, Mark Baldwin, Sean Curran, and Larry Martin, “Using a New Software Product Development Process for a Code Reuse Project,” *Proceedings of the 1999 Engineering of Computer-Based Systems Conference*, Nashville, TN, pp. 34-40, March 1999.
112. **James M. Conrad** and James J. Brickley, “Using Stiquito in an Introduction to Engineering Skills and Design Course,” *Proceedings of the 1997 Frontiers in Education Conference*, Pittsburgh, PA, pp. 1212-1214, November 1997.
113. Xuyang Li, Azhar Maqsood, and **James M. Conrad**, “Parallel Implementations of Direct Solvers for Sparse Systems of Linear Equations on a PVM System and a nCUBE Machine,” *Proceedings of the 1996 Arkansas Computer Conference*, Sercy, AR, pp. 52-63, March 1996.
114. **James M. Conrad** and Venkateswara R. Chitturi, “Success of an Institute on Engineering and Technology Institute for Secondary School Teachers,” *Proceedings of the 1995 Frontiers in Education Conference*, Atlanta, GA, pp. 4d5.2-6, November 1995.
115. **James M. Conrad** “Learning Computer Hardware Design Using Computer Aided Design Tools,” *Proceedings of the 1995 Frontiers in Education Conference*, Atlanta, GA, pp. 4d2.9-12, November 1995.
116. **James M. Conrad** “Architecture-Specific Algorithms for a Parallel Programming Course,” *Proceedings of the International Conference on Parallel Processing Workshop*, August 1995.
117. Arthur Hennessey and **James M. Conrad**, “Parallel Solutions to Geographic Information Systems Applications,” *Proceedings of the Arkansas Computer Conference*, Conway, AR, pp. 15-19, March 1995.
118. Kolluru Srinivas and **James M. Conrad** “A Parallel Forward-Checking Algorithm for Distributed Memory Multicomputers,” *Proceedings of the Arkansas Computer Conference*, Conway, AR, pp. 62-66, March 1995.
119. **James M. Conrad** and Luke M. Hassell, “A Senior-Level Computer Hardware Organization Course: Designing a Single Board Computer,” *Proceedings of the Workshop on Computer Architecture Education*, Raleigh, NC, January 1995. Also published in *IEEE Computer Society Technical Committee on Computer Architecture Newsletter*, pp. 21-27, Spring 1995.
120. **James M. Conrad**, “Introduction to Engineering Concepts for Middle, Junior High, and High School Teachers,” *Proceedings of the 1994 Frontiers in Education Conference, Educating Engineers For World Competition*, San Jose, CA, pp. 250-252, November 1994.
121. Susan A. Mengel and **James M. Conrad**, “Motorola 68000 Family Simulators in Education,” *Proceedings of the 1994 Frontiers in Education Conference, Educating Engineers For World Competition*, San Jose, CA, pp. 106-110, November 1994.
122. **James M. Conrad** and Jonathan W. Mills, “Inexpensive Technology Lab Exercises for Grades 6-9,” *Proceedings of the 1994 Frontiers in Education Conference, Educating Engineers For World Competition*, San Jose, CA, pp. 218-222, November 1994.

123. **James M. Conrad**, “A Computer Hardware Organization Course with an FPGA Lab Exercise,” *Proceedings of the Workshop on Designing Microelectronic Systems Using FPGAs*, San Jose, CA, November 1994.
124. **James M. Conrad** and Jerry Mathew, “A Backjumping Search Algorithm for a Distributed Memory Multicomputer,” *Proceedings of the 23rd International Conference on Parallel Processing*, St. Charles, IL, pp. 243-246, August 1994.
125. Kenneth L. Rusnok, Martin S. Lavine, and **James M. Conrad**, “Freedom '93: A Portable Speech Device,” *Proceedings of the 1994 Symposium on Applied Computing*, Phoenix, AZ, pp. 556-560, March 1994.
126. **James M. Conrad**, David L. Andrews, Darlene Butler, William Casady, Maria Coleman, and Matthew Gordon, “Introduction to Engineering Concepts for High School Teachers and Students,” *Proceedings of the 1993 Frontiers in Education Conference, Engineering Education: Renewing America's Technology*, Washington D.C., pp. 688-693, November 1993.
127. David L. Andrews, **James M. Conrad**, Leonard Schaper, Susan A. Mengel, and Daniel J. Berleant, “Design of a High Speed MIMD Distributed Processor Node Using MCM Technology,” *Proceedings of the 1993 International Electronics Packaging Conference*, San Diego, CA, pp. 132-139, September 1993.
128. Jerry Mathew, **James M. Conrad**, and Daniel J. Berleant, “Word Sense Disambiguation by Constraint Satisfaction - A Feasibility Study,” *Proceedings of the Arkansas Computer Conference*, Little Rock, AR, pp. 74-79, October 1993.
129. **James M. Conrad**, “Parallel Arc Consistency Algorithms for Pre-processing Constraint Satisfaction Problems,” *SIGART Bulletin*, Vol. 4, No. 1, page 39, January 1993.
130. **James M. Conrad** and Dharma P. Agrawal, “A Graph Partitioning-based Load Balancing Strategy for a Distributed Memory Machine,” *Proceedings of the 21st International Conference on Parallel Processing*, St. Charles, IL, Vol. II, pp. 74-81, August 1992.
131. **James M. Conrad** and Dharma P. Agrawal, “Distributed, Scaleable, and Static Parallel Arc Consistency Algorithms on Private Memory Machines,” *Proceedings of the 12th International Conference on Distributed Computing Systems*, Yokohama, Japan, pp. 442-449, June 1992.
132. Michael Teague, **James M. Conrad**, and Dharma P. Agrawal, “An Innovative Model of Generic Multiprocessors Using a Simulator,” *Proceedings of the Pittsburgh Conference on Simulation and Modeling*, Pittsburgh, PA, Part 3, May 1992.
133. **James M. Conrad**, Dharma P. Agrawal, and Dennis R. Bahler, “Scaleable Static Parallel Arc Consistency Algorithms for Shared Memory Computers,” *Proceedings of the Sixth International Parallel Processing Symposium*, Beverly Hills, CA, pp. 242-249, March 1992.
134. **James M. Conrad**, Dennis R. Bahler and James A. Bowen, “Static Parallel Arc Consistency in Constraint Satisfaction,” *Proceedings of the 1991 International Symposium on Methodologies for Intelligent Systems*, Charlotte, NC, pp. 500-509, October 1991.
135. **James M. Conrad** and Dharma P. Agrawal, “Performance of an Asynchronous Parallel Algorithm on a Generic Multiprocessor Simulator,” *Proceedings of the Pittsburgh Conference on Simulation and Modeling*, Pittsburgh, PA, pp. 1290-1297, May 1991.

### Magazine Articles

136. **James M. Conrad**, Gregg Vaughn, Mary Ellen Randall, Grayson Randall, and Percy Shadwell, “MOVE Makes a Difference”, *The Bridge*, vol. 113 (1), pp. 10-16, 2018.

137. **James M. Conrad**, “How a Project Office Can Improve an Engineering Company’s PM Skills Base,” Chief Project Officer (<http://www.chiefprojectofficer.com>), July 2005.
138. Scott Vu and **James M. Conrad**, “Racebot: A Two-Degree-of-Freedom Stiquito Robot,” *Circuit Cellar Ink*, pp. 48-53, Issue 141, April 2002
139. **James M. Conrad** and Serge Caron, “A Simple Circuit to Make Stiquito Walk on Its Own Effectively,” *Robot Science and Technology Magazine*, pp.14-19, Issue 8, Feb./Mar. 2001.
140. **James M. Conrad** and Mark van Dijk, “BeamStiquito,” *Circuit Cellar Ink*, pp. 10-12, Issue 120, July 2000.
141. **James M. Conrad** and Jonathan W. Mills, “A PC-Based Controller for the Stiquito Robot,” *Circuit Cellar Ink*, pp. 18-22, Issue 108, July 1999.
142. **James M. Conrad** and Wayne Brown, “Building an Inexpensive Insectoid Robot: Propulsion using Nitinol Wire,” *Robot Science and Technology Magazine*, pp. 12-19, January 1999.

### **Presentations and Panels**

Over 100 keynote talks, invited presentations or panel presentations made since 1994. These do not include conference paper presentations.

### **Inventions**

- Provisional Patent Application, 61/568,373, Robotic Device for Pipe Traversal, filed December 12, 2011.
- Provisional Patent Application, 61/568,363, Inflatable Linear Motion for Robotics, filed December 12, 2011.
- US Patent D591,186, Biometric Fingerprint Recognition Home Security System Alarm Panel, issued April 28, 2009.
- Robotic Microprocessor Board, Copyright 2004
- Analog Controller Board, Copyright 1999.
- PC Parallel Port Controller Board, Copyright 1999.
- Single-piece plastic molded Stiquito Body, Copyright 1997.
- Single-piece plastic molded Stiquito Controller, Copyright 1997.

### **GRANTS**

**Total Grant Activity: \$2,553,029 (\$1,873,239 at UNC Charlotte)**

#### **Principal Investigator – Research**

**(Total \$603,445, \$348,382 at UNC Charlotte)**

1. NC Space Grant Affiliate Program GY2017, NC Space Grant Consortium, \$12,500, July 1, 2017 – April 1, 2019.
2. NC Space Grant Affiliate Program GY2016, NC Space Grant Consortium, \$12,500, July 1, 2016 - June 30, 2017.
3. NC Space Grant Affiliate Program GY2015, NC Space Grant Consortium, \$10,000, July 1, 2015 - June 30, 2016.
4. Designing and Building an Outreach Robot, Discover Technology, Inc., \$10,000, June 26, 2015 - August 15, 2015.
5. NC Space Grant Affiliate Program GY2014, NC Space Grant Consortium, \$13,000, July 1, 2014-May 31, 2015.
6. NC Space Grant Affiliate Program GY2013, NC Space Grant Consortium, \$10,000, July 1, 2013 - June 30, 2014.

7. RecycleBot-An Interactive Recycling Robot, Charlotte Green Initiative, \$6,000, May 1, 2013-May 15, 2015.
8. Embedded Systems using the Renesas RX63N - Development of Microcontroller Materials, Renesas Electronics America, \$12,000, March 2013 - December 2013.
9. NC Space Grant Affiliate Program GY2012, NC Space Grant Consortium, \$15,000, July 1, 2012 - June 30, 2013.
10. NC Space Grant Affiliate Program GY2011, NC Space Grant Consortium, \$17,208, July 1, 2011 - June 30, 2012.
11. Embedded Systems using the Renesas RX62N - Development of Microcontroller Materials, Renesas Electronics America, \$30,000, July 2010 - January 2011.
12. An Autonomous Robotic Vehicle for Towing a Sensor Array, Zapata Engineering, \$32,450, March 2008-September 2009.
13. A Survey of Power Scavenging and Harvesting, Rosemount Aerospace Corporation, \$10,335, February –June 2006.
14. Embedded System Planning, Characterization and Development, Nekton Research (now iRobot Marine Division), \$16,456, August 2005 - August 2006.
15. A Digital Doppler Demodulator for use in Mobile Robotics Applications, Nekton Research (now iRobot Marine Division), \$10,149, August 2005-December 2005.
16. Micro Robots for Sub-Zero Degree Space Exploration, North Carolina Space Grant Consortium, \$2,000, UNC Charlotte Match \$2,000, August 2005-December 2006.
17. Water Quality Sensing using Embedded Systems, Nekton Research (now iRobot Marine Division), \$30,617, July 2005 - December 2005.
18. Embedded System Characterization and Development, Nekton Research (now iRobot Marine Division), \$44,363, May 2005 - August 2005.
19. Introducing Optical Device and Communications Topics into the UNC Charlotte ECE Embedded Systems Courses, Charlotte Research Institute and UNC Charlotte Optics Center, \$6,000, August 2005-January 2006.
20. Communication Protocol Decoder Development, Frontline Test Equipment, \$6,432, September 2004-May 2005.
21. Test Specification and Test Case Development of Communication Protocols, Frontline Test Equipment, \$38,872, May 2004-August 2004.
22. A Low-Power Embedded Systems and Communications Test Bed, UNC Charlotte Faculty Research, \$5,000, January 2004-December 2004.
23. Cooperative and Mobile Autonomous Robots, Arkansas Space Grant, \$15,000, University of Arkansas Match \$15,724, University of the Ozarks Match \$6,020, Motorola Match \$700, May 1995 - March 1996.
24. Introduction to Engineering Concepts for Middle, Junior High, and High School Teachers: Expanding the Preparation Workshop, Arkansas Department of Higher Education Promotional Grant, \$20,768, Arkansas Department of Education, \$5,000, AT&T Foundation, \$25,000, Acxiom Foundation \$5,000, University of Arkansas match, \$21,893, June 1995 - May 1996.
25. Parallel Constraint Satisfaction Algorithms for Multichip Module Design, Arkansas Science and Technology Authority, \$36,946 University of Arkansas match \$24,776, Oct. 1994 - Sept. 1995.
26. Introduction to Engineering Concepts for Middle, Junior High, and High School Teachers: Preparation Workshop, Arkansas Department of Higher Education Promotional Grant, \$38,000, Trinity Foundation of Arkansas, \$5,000, University of Arkansas match, \$35,236, July 1994 - July 1995.

**Principal Investigator – Education and Equipment  
(Total \$113,639, \$100,889 at UNC Charlotte)**

1. SoutheastCon 2018 Hardware Competition, NC Space Grant Consortium, \$5,000, November 30, 2017 - September 30, 2018.
2. Creating a New Program in Engineering Innovation and Entrepreneurship, National Collegiate Inventors and Innovators Alliance, \$41,250, April 1, 2012 - August 31, 2017.
3. A NASA Johnson Space Center Avionics Senior Design Project, NASA Exploration Systems Mission Directorate/Space Grant, \$29,000, May 2009 - June 2010.
4. An Integrated Course in Embedded Systems and Wireless Networks, UNC Charlotte Curriculum and Instruction Development, \$10,200, ECE Department match \$1,500, May 2006-May 2007.
5. Equipment Donation: Xilinx FPGA Boards for ECGR 2181 Logic Design, Xilinx, Inc., \$1,683, November 2005.
6. Equipment Donation: Xilinx FPGA Boards for ECGR 2181 Logic Design, Xilinx, Inc., \$1,584, February 2005.
7. Equipment Donation: A Low Cost, High Quality Array DFT Test Method, Intel, Inc., \$9,672, December 2004.
8. Web site Development and Maintenance for 2005, IEEE Charlotte Chapter, \$1,000, January-December 2005.
9. Distance Learning Course Development, North Carolina State University, \$4,000, Summer-Fall 1999.
10. Teaching Enhancement Grant, University of Arkansas Teaching and Faculty Support Center, \$2,000, January 1995 - May 1995 (developed teaching portfolio).
11. Engineering College Teaching Innovation Grant: Mobile Robots, University of Arkansas, College of Engineering, \$6,750, August 1994 - May 1995.

**Co-Principal Investigator – Research  
(Total \$1,688,497, \$1,387,088 at UNCC)**

1. ICore: Charlotte Ventureprise Launch, NSF, \$300,000, March 15, 2015-February 28, 2019.
2. Wireless Sensor Network for Valve Monitoring, Burkert Contromatic Corp., \$131,448, February 1, 2015 - May 31, 2016.
3. NETS: GOALI: Towards Adaptability to Variations of Renewable Energy in Large Scale Rechargeable Wireless Sensor Networks, NSF, \$300,017, September 2011 - August 2014.
4. Extension: Scalability and Sustainability Issues of Wireless Mesh Sensor Network for Substation Monitoring, Electrical Power Research Institute (EPRI), \$69,048, August 2009-December 2010.
5. Scalability and Sustainability Issues of Wireless Mesh Sensor Network for Substation Monitoring, Electrical Power Research Institute (EPRI), \$51,666, September 2008-July 2009.
6. Extension: Wireless Mesh Sensor Network for Fossil Plant Monitoring, Electrical Power Research Institute (EPRI), \$16,779, February 2008-December 2008.
7. Wireless Mesh Sensor Network for Fossil Plant Monitoring, Electrical Power Research Institute (EPRI), \$40,000, February 2008-December 2008.
8. Extension: Wireless Mesh Sensor Network for Power Plant Monitoring, Electrical Power Research Institute (EPRI), \$40,841, February 2008-December 2008.
9. Extension: Wireless Mesh Sensor Network for Power Plant Monitoring, Electrical Power Research Institute (EPRI), \$54,083, September 2007-December 2007.
10. Wireless Mesh Sensor Network for Power Plant Monitoring, Electrical Power Research Institute (EPRI), \$83,566, September 2006-August 2007.
11. TECT: Teaching Engineering to Counselors and Teachers, NSF, \$300,000, May 2006-May 2009.



12. Computer Architectures for Multichip Modules: Short Range Plans, College of Engineering, \$301,409, Jan. 1993 - August 1994, Funded by the Univ. of Arkansas College of Engineering, Arkansas High-Density Electronics Center, IDT, and Motorola.

### **Co-Principal Investigator – Education and Equipment**

**(Total \$147,448, \$36,880 at UNCC)**

1. Equipment Donation: Wireless Personal Area Network Boards and Software, \$36,880, Eaton Corporation, July 2005.
2. Science Crusade: Higher Order Thinking in Science, Arkansas Department of Higher Education \$42,956, University of Arkansas match \$9,590, January 1996 - December 1996.
3. Science Crusade: Higher Order Thinking in Science, Arkansas Department of Higher Education \$50,856, University of Arkansas match \$7,166, January 1995 - December 1995.

### **DONATIONS**

**Donations (Total \$226,142, \$226,142 at UNCC)**

- Donations from AREVA, Defense Technologies, Eaton, EPRI, Parsons, Stabilis, Shaw, Timken, Charlotte Research Institute and others to support the UNC Charlotte College of Engineering Senior Design Program, approximately \$118,000, Fall 2007/Spring 2008.
- Donations from EPRI, Hargraves Fluidics, Irwin Tools, Lowes Hardware, IBM, Charlotte Research Institute and others to support the UNC Charlotte College of Engineering Senior Design Program, approximately \$70,000, Fall 2006/Spring 2007.
- Received over \$40,000 in donations of embedded systems boards, parts, and software from ten companies for use in education and research (2003 to present).
- Secured \$11,600 in donations for UNCC Student Chapter of IEEE (2003 to 2009).

### **STUDENT ADVISING OF RESEARCH**

The field of Embedded Systems is one of the very important sub-disciplines of today's electronics industry. Employers seek MSEE and MSCompE graduates in much higher numbers than Ph.D graduates. Therefore, you will find that our graduate program in this area produces many more graduates with MS degrees.

### **Completed PhD Dissertations (at UNC Charlotte)**

1. Benjamin Rhoades, Ph.D. EE, *A Novel Framework for Integrating Legacy Vehicles into an Intelligent Transportation System*, 5/2018.
2. Tyler Major, Ph.D. EE, *A Novel Principal and Independent Component Analysis Preprocessing Technique for Neural Network Classification of Electroencephalography Signals for Brain Computer Interface Development*, 5/2018.
3. Samuel Shue, Ph.D. EE, *Utilization of Wireless Signal Strength for Mobile Robot Localization in Indoor Environments*, May 2017. Giles Scholarship Award.
4. Balasubramanian Chandrasekaran, Ph.D. EE, *A Selective Sensor Framework Using Sensor Fusion and Sensor Maps to Achieve Complete Coverage Planning of a Semi-Autonomous Robotic Vehicle*, 5/2017. Provost Doctoral Teaching Fellow Award.
5. Adam Harris, Ph.D. EE, *Integration of the Simulation Environment for Autonomous Robots with Robotics Middleware*, 5/2014.

### **In-progress PhD Dissertations (at UNC Charlotte)**

1. David Grabowsky, Ph.D. EE, 5/2021

**Completed Masters Thesis's (at UNC Charlotte unless noted)**

1. Jaydeep Kshirsagar, MSEE, *Implementation of Multi Robot Simultaneous Localization and Mapping*, 7/2018.
2. David Grabowsky, MSEE, *Utilizing orientation estimation from trilaterated poses over time to improve RO-EKF SLAM*, 7/2018.
3. Mukul Anil Gosavi, MSEE, *Functional Safety Model for Electrical/Electronic component of an Autonomous Vehicle*, 6/2018.
4. Aishwarya Panchpor, MSEE, *Implementation of Path Planning Algorithms on a Mobile Robot in Dynamic Indoor Environments*, 5/2018.
5. Nelyadi Samyak Shetty, MSEE, *Sensor Fusion Framework and Simulation on a TurtleBot Robotic Vehicle*, 5/2018.
6. Shruti Gangadhar, MSEE, *Sensor Fusion Framework and Simulation on a TurtleBot Robotic Vehicle*, 5/2017.
7. Chris Wesley, MSEE, *Design of a Vision-based Control System for Quadrotor Swarm Autonomy*. 6/2015.
8. Tyler Major, MSEE, *Developing a Brain Computer Interface Control System for Robotic Movement in Two Dimensions*, 12/2014.
9. Steve Erdmanczyk, MSEE, *Adaptive Deployment of Mobile Sensor Nodes*, 12/2013.
10. Vasanthsekar Shekar, MSEE, *Low Voltage, Multiple Axis, High Speed, Droplet Manipulation Technique in Open Surface Optoelectrowetting Microfluidic Device*, 5/2012 (co-advisor with Srinivas Akella).
11. Suraj Swami, MSEE, *Temperature, Strain and Acoustic Emission Monitoring of a Natural Boulder Exposed to the Sun: a Test of the Efficacy of Insolation on Physical Weathering*, 8/2011 (co-advisor with Kimberly Warren).
12. Onkar Raut, MSEE, *Shape Recognition for Plane Closed Curves Using Error Model of an Elliptical Fit and Fourier Descriptors*, 8/2011.
13. Sunil Kumar Gurram, MSEE, *Implementation of Controller Area Network (CAN) Bus in an Autonomous All-Terrain Vehicle*, 8/2011.
14. Adam Harris, MSEE, *Design and Implementation of an Autonomous Robotics Simulator*, 5/2011.
15. Siddharth Ahuja, MSEE, *System Design and Software Architecture of a Differential Global Positioning System for an Autonomous All-Terrain-Vehicle*, 8/2009.
16. Sharayu Ghangrekar, MSEE, *A Path Planning and Obstacle Avoidance Algorithm for an Autonomous Robotic Vehicle*, 4/2009.
17. Chaitanya Misal, MSEE, *Analysis of Power Consumption of an End Device in a ZigBee Mesh Network*, 12/2007.
18. Nick Wieder, MSEE, *System-on-programmable-chip Design using a Unified Development Environment*, 5/2007.
19. Sonia Thakur, MSEE, *Embedded Linux Platform to Collect, Analyze and Control Flow of Sensor Networks*, 12/2006.
20. Sandeep Sirpatil, MSEE, *Implementation of an IEEE 802.15.4 Protocol Stack for Linux*, 11/2006.
21. Ishfan Vakil, MSEE, *Using Optical Communications with Embedded Systems*, 11/2006.
22. Gajendra Singh, MSEE, *Development of Multithreaded Real-time Data Acquisition Solutions*, 8/2006.
23. Rajan Rai, MSEE, *IEEE 802.15.4 Protocol Implementation and Measurement of Current Consumption*, 4/2006.
24. Assad Ansari, MSEE, *Hardware Development of an Embedded Wireless Evaluation Board*, 11/2005.
25. Murari Raghavan, MSEE, *Testing of a New Wireless Embedded Board*, 11/2005.

26. Binada Ramachandran, MSCSE, *Parallel Lookahead Procedures with Respect to Constraint Satisfaction Problems*, 12/1995 (Arkansas).
27. Krishnamurthy Ramalingham, MSCSE, *Comparative Study of the NQueens Problem Using Multiple Parallel Architectures*, 10/1995 (Arkansas).
28. Jerry Mathew, MSCSE, *Parallel Search Algorithms for Solving Constraint Satisfaction Problems*, 12/1993 (Arkansas).

#### **In-progress Masters Thesis's (at UNC Charlotte)**

29. Lauren Johnson, MSEE, 12/2018.
30. Sunny Arokia Swamy Bellary, MSEE, 12/2018.
31. Terrill Massey, MSEE, 12/2018.
32. Raj Gupta, MSEE, 5/2019.
33. Karim Erian, MSEE, 5/2019.
34. Jacob Morgan, MSEE, 12/2019.

#### **Completed Masters Projects (at UNC Charlotte unless noted)**

35. Rahul Patil, MSEE, *Simultaneous Localization and Mapping Using Extended Kalman Filtering*, 5/2017.
36. Jeremy Sabo, MSEE, *Enabling a National Instruments DaNI 2.0 Robotic Development Platform for the Robot Operating System*, 5/2017.
37. Vivek Margapuri, MSEE, *Landmark Extraction Using Random Sample Consensus*, 5/2017.
38. Chinmay Admane, MSEE, *ZapataBot*, 5/2016.
39. Pallavi Mahendra Avle, MSEE, *ZapataBot*, 5/2016.
40. Tejas Ashok Badgular, MSEE, *Landmark Detection and Association for SLAM Implementation on Robot Operating System*, 5/2016.
41. Vedhas Deshpande, MSEE, *Multi-threaded Piconet ZigBee Infrastructure to Vehicle Communication Algorithm*, 5/2016.
42. Abhimanyu Dhone, MSEE, *Embedded Systems and Robotics*, 5/2016.
43. Saili Ghavat, MSEE, *RASNAC Algorithm for Corner Detection*, 5/2016.
44. Prasad V. Iyengar, MSEE, *Building and Implementing a Full-Scale Upper Torso and Cranial Humanoid Robot (InMoov)*, 5/2016.
45. Vinit Katariya, MSEE, *Embedded Systems and Robotics*, 5/2016.
46. Sanjay Krishna Katragadda, MSEE, *A Survey on Robot Localization in Extraterrestrial Environments*, 5/2016.
47. Sandesh Kesarla Nagaraja Gupta, MSEE, *Localization of a Robot Using Computer Vision*, 5/2016.
48. Pranay Kona, MSEE, *Embedded Systems and Robotics*, 5/2016.
49. Gautam Korikar, MSEE, *Localization of Extraterrestrial Robot using Camera and LIDAR*, 5/2016.
50. Aniket Marathe, MSEE, *Valve Measurements System*, 5/2016.
51. Balaji Masanamuthu Chinnathurai, MSEE, *Communication Interface for RecycleBot using ZigBee*, 5/2016.
52. Ramakrishnan Sivakumar, MSEE, *Design and Implementation of a Semi-Autonomous Waste Segregation Robot (RecycleBot)*, 5/2016.
53. Disha Srivastava, MSEE, *Design and Development of a Standard ROS enabled All-Terrain Vehicle*, 5/2016.
54. Vivek Thakkar, MSEE, *Implementation of an x86 based JOS kernel*, 5/2016.
55. Dhairya Gala, MSEE, *An Embedded System for Sensing Valve Characteristics*, 12/2015.
56. Nikila Narayanan, MSEE, *Frontier Exploration in Robotic Operating System (ROS)*, 12/2015.

57. Stalen Rumao, MSEE, *Simultaneous Localization and Mapping application on a mobile robot*, 12/2015.
58. Sushuruth Sadagopan, MSEE, *Image Processing for RecycleBot: Visually Identifying Recyclable Objects*, 12/2016.
59. Binesh Asok Kumar, MSEE, *RecycleBot - Motor Control*, 6/2015.
60. Srinivas Arnepalli, MSEE, *Altitude Hold Using Sonar for a Quadcopter Using Crius All-in-one Pro v2*, 5/2015.
61. Jeeten Handu, MSEE, *Quadrotor Swarming Robots - Motion Tracking User Interface*, 5/2015.
62. Nitish Kale, MSEE, *RecycleBot: Trash Separation using Image Processing Algorithms*, 5/2015.
63. Aniket Nigudkar, MSEE, *Quadrotor Flight Stability*, 5/2015.
64. Priyank Pandya, MSEE, *Implementation of LiDAR for Obstacle Detection*, 5/2015.
65. Swapnesh Shinde, MSEE, *Stabilization and Wireless control of a Quadcopter using XBee ZigBee*, 5/2015.
66. Saketh Kosanam, MSEE, *Communications between a Flying Robot and a Base Station*, 12/2014.
67. Vastal Soni, MSEE, *RecycleBot: Systems Integration of Sensors and Path Planning*, 12/2014.
68. Dharmik Mehta, MSEE, *RecycleBot: Systems Integration of Motion Planning and Actuation*, 12/2014.
69. Tanmay Sane, MSEE, *Communications between Autonomous Robots and Base Stations*, 12/2014.
70. Sultana Alimi, MSEE, *Design and Implementation of an Open-Source Wireless Sensor Network Development Platform*, 5/2014.
71. Kunal Bagewadi, MSEE, *RecycleBot: Software Implementation of Drivetrain and its Integration with a Navigation System*, 5/2014.
72. Aditya Bahulekar, MSEE, *RecycleBot: A Path Planning Algorithm using a GPS Receiver and Digital Compass*, 5/2014.
73. Pranav Deopurkar, MSEE, *RecycleBot: Trash Bin Actuation and Separation Mechanism*, 5/2014.
74. Akshay Deshpande, MSEE, *RecycleBot: Sorting Recyclable Waste by Image Processing Techniques*, 5/2014.
75. Amogh Gokhale, MSEE, *RecycleBot: Human-Machine Interface*, 5/2014.
76. Rohan Lele, MSEE, *RecycleBot: Power Supply Distribution and Drive Train Design*, 5/2014.
77. Venkatrama Papashastry Manjunath, MSEE, *RecycleBot: Object Recognition to Distinguish Between Recyclable and Non-recyclable Trash*, 5/2014.
78. Samuel Shue, MSEE, *Development of a Portable XBee C Library and RSSI Triangulation Localization Framework*, 5/2014.
79. Mayuka Srinivasan, MSEE, *Control of Autonomous Flight of a Quadcopter using the Crius All-In-One Pro V2*, 5/2014.
80. Robin Davidsson, MSEE, *RecycleBot: Designing and Building an Interactive Recycling Robot*, 12/2013.
81. Cory Engel, MSEE, *Quadrotor Swarm Applications*, 12/2013.
82. Yevgeny Fridlyand, MSEE, *Education Materials for Embedded Systems*, 12/2013.
83. Abhiram Reddy Gandhari, MSEE, *RecycleBot: Image Processing*, 12/2013.
84. Josh Henderson, MSEE, *ZapataBot Remote Controlled ATV*, 12/2013.
85. Sravankumar Kambam, MSEE, *RecycleBot: Localization*, 12/2013.
86. Srujan Maram, MSEE, *Dynamic Brightness Control and VLC System Using High Power LED*, 8/2013.
87. Shweta Gupte, MSEE, *Complete Coverage Path Planning of Autonomous Robot*, 5/2013.
88. Keith Hunter, MSEE, *Visible Light Communication Using a Digital Camera and an LED Flashlight*, 5/2013.
89. Ravi Kuruvila, MSEE, *Directed RRT Implementation on Car-like Robots*, 5/2013.

90. Craig Pavlich, MSEE, *Design of a CAN-Enabled Steering Control Node for an Autonomous ATV*, 12/2012.
91. Jeffery Skelnik, MSEE, *Integration of a Java-based Roomba Robot Simulator with an External Software Service*, 6/2012.
92. Walter Barfield, MSEE, *Control of a robot using LabVIEW on an Arm-based Embedded Board*, 5/2012.
93. John Cortner, MSEE, *Autonomous ATV Steering*, 12/2011.
94. Paul Mohan Das, MSEE, *An Algorithm for Landing a Quadrotor Unmanned Aerial Vehicle on an Oscillating Surface*, 12/2011.
95. Vikram Gill, MSEE, *Design and Development of Sensors for SEAR Simulator*, 12/2011.
96. Archana Subramanian, MSEE, *ADCs/DACs and Audio Data on Renesas Microcontrollers*, 5/2011.
97. Suganya Jebasingh, MSEE, *Throughput of Sensor Fusion Using Renesas RX62N and QSK62P Plus Microcontrollers*, 12/2010.
98. Aswin Ramakrishnan, MSEE, *Analysis of Floating Point Operations in Microcontrollers*, 12/2010.
99. Kunal Bavishi, MSEE, *Sensor Data Fusion in Robotics*, 12/2010.
100. Jerry Zacharias, MSEE, *Environmental Monitoring with Sensors for Autonomous Vehicles*, 8/2010.
101. Balasubramaniyan Chandrasekaran, MSEE, *Path Calculation and Obstacle Avoidance Algorithm for an Autonomous Robotic Vehicle*, 5/2010.
102. Amit Kumar, MSEE, *An Embedded and Wireless System: Restaurant Paging Device*, 12/2009.
103. Malcolm Zapata, MSEE, *Autonomous ATV controls and obstacle avoidance*, 12/2009.
104. Kailash Toshniwal, MSEE, *Interrupt based web interfaced embedded monitoring over wireless intra-net in Linux for autonomous ATV*, 12/2009.
105. Richard McKinney, MSEE, *Components of an Autonomous ATV (Robotics and Embedded Systems)*, 5/2009.
106. Anagha Basole, MSEE, *Wireless Communication between Autonomous Vehicles*, 12/2008.
107. Shrenik Mehta, MSEE, *Line Extraction using LIDAR*, 12/2008.
108. Praneeth Bajjuri, MSEE, *Communications using ZigBee Modules*, 12/2007.
109. Santosh Ramani, MSEE, *Developing Applications using ZigBee Modules*, 12/2007.
110. Ashwin Subramanian, MSEE, *Developing Applications using ZigBee Modules*, 12/2007.
111. Sravanthi Chalasani, MSEE, *Performance Analysis of an RTOS*, 12/2007.
112. Chitti Srilekha, MSEE, *Performance Analysis of an RTOS*, 8/2007.
113. Gurunath Athalye, MSEE, *Educational Board for Stepper Motor Interface*, 8/2007.
114. Priyanka Krishna, MSEE, *Performance Analysis of a Renesas M16C/62P Processor*, 8/2007.
115. Sushant Sengupta, MSEE, *A Wireless Strain Gauge Measurement System*, 5/2007.
116. Christina Warren, MSEE, *Embedded Systems Micro File System*, 5/2007.
117. Pinank Mahesh Shah, MSEE, *A Wireless Strain Gauge Measurement System*, 5/2007.
118. Asma Khizer, MSEE, *USB Solutions for Small Embedded System Applications*, 5/2007.
119. Venkat Dronamraju, MSEE, *Educational Board for Stepper Motor Interface*, 12/2006.
120. Ritesh Savla, MSEE, *A Wireless Strain Gauge Measurement System*, 12/2006.
121. Michael Thomas, MSEE, *DSP algorithms on a microcontroller*, 8/2006.
122. Guru Mysore, MSEE, *Embedded Linux*, 8/2006.
123. Aarthi Balan, MSEE, *Software Development Processes*, 5/2006.
124. Tejaswini Gadicherla, MSEE, *Communication between a ZigBee Board and Renesas MSV30262-SKP Board Using I2C*, 5/2006.
125. Nagalakshmi Kurnella, MSEE, *Wireless Communications between Stiquito Robots*– 4/2006.
126. Arthi Varadarajan, MSEE, *Porting a Real-time Operating System to the ATmega 128L*, 12/2005.
127. Brian Newberry, MSEE, *Data Storage Solution for Digital Signal Processors*- 12/2005.
128. William Snyder, MSEE, *USB2.0 Communications*, 5/2005.

129. George Sandler, MSEE, *A High-Precision Coulomb Counter Circuit*, 8/2004.
130. Venkateswara R. Chitturi, MSCSE, *Success of an Institute on Engineering and Technology Institute for Secondary School Teachers*, 8/1995 (Arkansas).

**In-progress Masters Projects (at UNC Charlotte)**

1. Gukul Mathavan, MSEE, 12/2018.
2. Jefferson Cooper, MSEE, 12/2018.

**Undergraduate Research Projects (at UNC Charlotte unless noted)**

1. David Grabowsky, BSCpE, spring and summer 2017.
2. Lauren Johnson, BSCpE, supported by NC Space Grant Summer Research Program, summer 2016.
3. Walden Saldana-Montavon, BSEE, supported by UNC Charlotte Summer Research Program, summer 2016.
4. Michael Lackey, BSME, Designing and Building an Outreach Robot, summer 2015 and 2016.
5. Stuart Gambill, BSME, Designing and Building an Outreach Robot, summer 2015.
6. Marcos Brenes, BSCS, supported by UNC Charlotte Summer Research Program, summer 2014.
7. Audrow Nash, BSEE, supported by UNC Charlotte Summer Research Program, summer 2013.
8. Jeremy Sabo, BSCpE, supported by UNC Charlotte Summer Research Program, summer 2012.
9. Peter O'Connor, BSEE, supported by UNC Charlotte Summer Research Program, summer 2012.
10. Sergey Morozov (from Virginia Tech), supported by the ECE Research Experiences for Undergraduates, UNC Charlotte Graduate School Grant, summer 2008.
11. Melinda Dees, BSEE and BSCpE, *Robotics in Sub-zero Space Environments*, Undergraduate Research Grant awarded by the NC Space Grant Consortium– 5/2007.
12. Kristen Reband, BSCpE, *Robotic Propulsion Materials in Sub-zero Space Environments*, Undergraduate Research supported by the NC Space Grant Consortium award, 5/2008.

## TEACHING

### Courses Taught - University Of North Carolina at Charlotte

- ECGR 2181 – Logic Design I (2005, 2006, 2008, 2009, 2015, 2016, 2018)
- ECGR 3159 – Professional Practice (2018)
- ECGR 3183 – Computer Organization and Programming Languages (2004)
- ECGR 3192/4182 - Independent Studies (6 projects)
- ECGR 3253 – Senior Design I (2006, 2007(2), 2008)&&
- ECGR 3254 – Senior Design II (2007(2), 2008)&&
- ECGR 3253/3254 – Senior Design Project - advisor to student groups (23 projects 2003-present)
- ECGR4090/5090 – Special Topics: Technology Innovation and Entrepreneurship (2013, 2014, 2015, 2016).
- ECGR 4101/5101 –Embedded Systems (2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010\*\*, 2011, 2012\*\*(2), 2013, 2014, 2015, 2016, 2017, 2018)
- ECGR 4161/5196 and MEGR4127 – Introduction to Robotics (2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018)
- ECGR 6890- Independent Studies (98 project students)
- ECGR 6185/8185 – Advanced Embedded Systems (2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2013, 2014, 2015, 2016)
- ENGR 1202 – Introduction to Engineering II - Electrical and Computer (2007, 2012, 2013 (2), 2014 (2), 2015 (2), 2016 (2), 2017 (2) – team-taught; 2018)
- ENGR 3295 – Professional Development (2010, 2011(2), 2012(2), 2013 - team taught)
- ETGR 4133 – Embedded Systems (2012)

&& Reestablished the College of Engineering Multidisciplinary Senior Design Program

\*\* Indicates courses taught as an online course with previously recorded lectures but “live” labs and exams.

### Courses Taught - University Of North Carolina at Charlotte – Continuing Education

- Project Risk Management (10/2006, 2/2007, 5/2007, 9/2007, 10/2007(2), 12/2007, 1/2008)
- Project Schedule Development (2/2007, 3/2007, 5/2007, 10/2007)
- Microsoft Project for Project Managers (3/2007, 10/2007)
- Introduction to Project Management (5/2008)
- Engineering Ethics (10/2011)

### Courses Taught - North Carolina State University

- ECE 206 - Introduction to Computer Organization (2000, 2001(2)).\*\*
- ECE 218 - Introduction to Microprocessors and Assembly Language Programming (1991, 1992, 1998, 1999(2), 2000).\*\*
- ECE 292D - Introduction to Engineering Skills and Design (Assisted - 1996).
- ECE 292B - Simple Robots and Microprocessors (2001, 2002)
- ECE 306 – Introduction to Embedded Systems (2003(3))
- ECE 406 - Design of Complex Digital Systems (2002, 2003)\*\*
- ECE 480/481 - Senior Design Project - Student Advisor (7 projects 1999-2003)
- ECE 497 - Special Topics - Parallel Programming (1991).

\*\* Indicates courses taught to both live and distance education students

### Courses Taught - University Of Arkansas

- CSEG 1913: Introduction to Computers

- CSEG 2723: Computer Programming Applications
  - CSEG 3933: A Programmer's Introduction to C
  - CSEG 4523: Microprocessor Programming Techniques
  - CSEG 457V: Senior Design Project
  - CSEG/ELEG 4983: Computer Hardware Organization/Design
  - CSEG 5053: Real-Time Data Acquisition Systems
  - CSEG 5303: Parallel Programming\*\*
  - ELEG 5273: Electronics Packaging (Team Taught)
  - ELEG 6273: Advanced Electronics Packaging (Team Taught)
  - GNEG 5003: Topics in Engineering for Teachers
  - PHSC 5003: Higher Order Thinking in Science (Science Crusade)
  
  - CSEG 410: Special Topics - Software Quality Assurance
  - CSEG 410: Special Topics - Advanced Motorola Processors
  - CSEG 410: Special Topics - Design of a Motorola-based Microcontroller Board
  - CSEG 410: Special Topics - A Microcontroller-based Speech Device
  - CSEG 410/510: Special Topics - Parallel Programming
  - CSEG 410/510, ELEG 488/588: Special Topics - Mobile Robots
  - CSEG 457v: Senior Design Project - Student Advisor (14 projects 1992-1995)
  - ELEG 588: Special Topics - Design of a Motorola-based Computer Board
- \*\* Indicates courses taught to both live and distance education students



## UNIVERSITY AND COMMUNITY SERVICE

### UNIVERSITY SERVICE

#### **Electrical and Computer Engineering Department**

- Department Review Committee (Tenure Review), 2007-2010, 2015-2016, 2018-2019 (chair 2007-2008, 2009-2010, 2015-2016).
- Computer Engineering Focus Area Improvement Team (Computer Engineering Curriculum Committee), 2003-present (chair from 2005-2010, 2015-2016).
- Outreach Committee, 2013-present.
- Associate Department Chair and Computer Engineering Curriculum Coordinator (2017-present).
- Associate Department Chair and Undergraduate Coordinator (2010-2013).
- Faculty Search Committee 2003-2006, 2008, 2012, 2016 (chair from 2003-2004, 2005-2006).
- Industry Advisory Committee, faculty representative, 2004-2007, 2010-2013.
- Advisor, Student Branch, IEEE, 2004 - 2009.
- Undergraduate Curriculum Committee 2005-2013 (chair 2008-2013).
- Awards Committee 2005-2007.

#### **Campus/College**

- Advisor, Charlotte Area Robotics Club (UNC Charlotte student club), 2008 - present.
- University Commencement Committee (name reader coordinator), 2010-present.
- University Communication across the Curriculum Steering Committee, 2011-2015.
- Special Task Force - Review of the University Career Center, 2014.
- College of Engineering Review Committee (Tenure Review), 2010-2011, 2016-2018 (chair).
- College of Engineering, Search Committee, Faculty Associate for First Year Program, 2010, 2011.
- Faculty Council, Department Representative, 2009 - 2010.
- College of Engineering, College of Engineering Faculty Organization, President, 2008-2009.
- College of Engineering, Search Committee, Faculty Associate for Transfer Students, 2008.
- College of Engineering, Systems Engineering Faculty Search Committee, 2008, 2012-2013.
- College of Engineering, College of Engineering Faculty Organization, President Elect, 2007-2008.
- University Search Committee, Executive Director of Technology Transfer, 2007.
- College of Engineering, Search Committee, Director of MAPS program 2006.
- College of Engineering Computing Committee, 2003 - 2005.
- Summer Sessions Committee (FASSC) 2005-2008.

### SERVICE AS A REVIEWER

#### **ABET Computer Engineering Program Evaluator (ABET PEV)**

- ABET Evaluator, 2011, 2012, 2014, 2015, 2016, 2017, and 2018 (2).
- ABET PEV training April 30-May 1, 2011.

#### **Professional Reviews/Panels**

- National Science Foundation (1995, 2004, 2005, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2018).
- National Institutes of Health (2011).
- Department of Education (2003, 2004, 2007, 2008, 2009, 2010, 2013, 2015).
- Joint Task Force of ACM & IEEECS on Computer Engineering Curriculum (2002).

#### **Publication Reviews**

- Book chapters and proposals: PPI, Wiley Books, Thompson Books, Cambridge University Press, Morgan Kaufmann Publishing, McGraw-Hill, IEEE CS Press, Addison Wesley Publishing.

- Journals: ACM, IEEE, and other journals.
- Conferences: ASEE, ACM, IEEE, PMI and other conferences.
- Other: external PhD dissertations; external university courses.

## **PROFESSIONAL INTERNATIONAL/NATIONAL SERVICE**

### **Professional Service Activities**

- NC FIRST Board of Directors, 2015-present.
- IEEE Eta Kappa Nu (HKN) Board of Governors, 2018-2020. HKN Conferences Committee Chair 2018 – present.
- IEEE Board of Directors, IEEE-USA Board of Directors, 2016-2017.
- IEEE Region 3 Past-Director, 2018-2019.
- IEEE Region 3 Director, 2016-2017.
- IEEE Region 3 Director-Elect, 2014-2015.
- IEEE Region 3 Executive Committee, 2006-present.
- IEEE NC Council, Chair 2008- 2009
- IEEE Charlotte Section, Chair, 2006-2007.
- IEEE Charlotte Section, Secretary, 2012.
- IEEE Charlotte Section, Executive Committee, 2004-present.
- IEEE Education Society, Charlotte Chapter, Chair 2007-present.
- IEEE Computer Society, Charlotte Chapter, Chair 2005.
- Advisor, UNC Charlotte IEEE Student Chapter, 2004-2009.
- ASEE Design in Engineering Education Division Chair, 2009-2010.
- ASEE Design in Engineering Education Division VP/Secretary/Treasurer, 2008-2009.
- Wireless Industrial Networking Alliance (WINA), System Integration Technical Committee, 2004-2006.
- Meetings Chair, Charlotte Software Process Improvement Network (an SEI organization), 2004-2006.
- IEEE Eastern NC Section, Meetings Committee Chair, 2001-2003.
- Scientist in the Classroom, visit schools to discuss engineering and science, developed hands-on activity for 4<sup>th</sup> grade students - “What is inside a Mobile Phone,” 2000-2003.
- Leadership Council, Meetings Chair, RTP Software Process Improvement Network (an SEI organization), 2000-2002.
- Charter Teacher Trainer, Arkansas Science Crusade 1994-1995
- IEEE Computer Society, Membership Activities Board, Student Act. Comm., 1993-1995

### **Professional Service Activities - Publications**

- IEEE Computer Society, Press Operations Committee, 2002-2009. Editor, Systems Series, 2004-2009.
- Contributing Editor, Arkansas Computer Bulletin, 1992-1993
- Associate Editor-in-Chief, *IEEE Computing Futures Magazine*, 1990-1991

### **Professional Service Activities-Conference Leadership**

- Technical Program Co-Chair, IEEE SoutheastCon 2020, Raleigh, NC, March, 2020.
- Technical Program Chair, IEEE Conference on Signal Processing and Communication Engineering Systems, Vijayawada, India, January 4-5, 2018.
- General Chair, IEEE SoutheastCon 2010, Charlotte, NC, March 18-21, 2010.
- Co-Program Chair, MASCOTS 2009: 17th Annual Meeting of the IEEE/ACM International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems, September 21-23, 2009, South Kensington Campus, Imperial College London.

- Program Chair, ASEE Annual Conference, Design in Engineering Education Division, Pittsburgh, PA, June 22-25, 2008.
- Registration and Exhibits Chair, International Symposium on High-Performance Computer Architectures, 1995.
- Technical Program Chair, Arkansas Computer Conference, 1995

### **Professional Service Activities - Conferences**

- Technical Program Committee, International Conference on Informatics in Control, Automation and Robotics (ICINCO), 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018.
- Technical Program Committee, BIODEVICES Conference, 2014, 2015, 2016, 2017, 2018.
- Program Committee, Workshop on Computer Architecture Education, 2004, 2005, 2006, 2007, 2008, 2009, 2011, 2015, 2017.
- Technical Program Committee, IEEE/ACM International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS), 1996, 2010, 2011, 2012.
- Technical Program Committee, IEEE International Performance Computing and Communication Conference (IPCCC), 2010, 2011.
- Technical Program Committee, Communication and Networking Simulation Symposium (CNS), 2008, 2009, 2010, 2011, 2013, 2016, 2017.
- Technical Program Committee, 2013 International Conference on Multi Media Processing, June 22-24, 2013, Sousse, Tunisia.
- Technical Program Committee, IEEE International Performance Computing and Communication Conference 2010 (IPCCC'2010), December 9-11, 2010, Albuquerque, New Mexico.
- Program Chair Elect, ASEE Annual Conference, Design in Engineering Education Division, Honolulu, HI, June 24-27, 2007.
- Technical Program Committee, IEEE SoutheastCon 2007, Richmond, VA, March 22-25, 2007.
- Program Committee, IEEE International Workshop on Heterogeneous Multi-Hop Wireless and Mobile Networks, 2005, 2006.
- Track Chair, 2006 International Conference on Engineering Education, San Juan, PR, July 2006.
- Technical Committee, Track Co-chair, IEEE SoutheastCon 2006, Memphis, TN, March 30-April 2, 2006.
- Program Committee, 2nd IEEE International Conference on Mobile Ad-hoc and Sensor Systems, Washington, DC, November 7-11, 2005.
- Program Committee, International Workshop on Strategies for Energy Efficiency in Ad Hoc and Sensor Networks 2005 (IWSEEASN 2005) in conjunction with the 24th International Performance, Computing, and Communications Conference, Phoenix, Arizona, April 7-9, 2005.
- Session Chair, Frontiers in Education Conference, 2003.
- Panel Moderator, Workshop on Computer Architecture Education, 1995.
- Steering Committee, Arkansas Computer Conference, 1995-1996
- Session Chair, International Conference on Parallel Processing, 1989

## **COMMUNITY SERVICE**

### **Outreach**

- Board of Directors, American Red Cross, Southern Piedmont Chapter (Western North Carolina), 2017-present.
- Board of Directors, STEM Career Path Project, 2013-present.
- Engineering Presentations, Middle and High Schools, 2004-present.
- Boy Scouts of America, Robotics Merit Badge Requirements and Book Writing Committee, 2010.

- Computers/Energy/Electronics/Robotics Merit Badge Counselor, Boys Scouts of America, 2004-present.
- Advisor/Mentor, UNC Charlotte Pre-College Research Experiences Summer 2004, 2005, 2008, 2010, 2015, 2016.
- Competition Organizer, Robotics, Science Olympiad, Charlotte, NC, 2004, 2005.
- Judge, Charlotte Mecklenburg Regional Science Fairs, Charlotte, NC.

### Media Contact

- Interviewed by WCNC-TV (Charlotte, NC) on the UNC Charlotte Science and Technology Expo, live studio piece, April 27, 2018.
- Interviewed by WCNC-TV (Charlotte, NC) on Drones and Commercial Aircraft, June 13, 2017.
- Interviewed by WJZY-TV (Charlotte, NC) on the UNC Charlotte Science and Technology Expo, live studio piece, April 13, 2016.
- Interviewed by WCCB-TV's morning program "Wilson's World" (Charlotte, NC) on robotics at UNC Charlotte, September 2, 2015.
- Interviewed by WCNC-TV (Charlotte, NC) on the UNC Charlotte Science and Technology Expo, live studio piece, April 21, 2015.
- Interviewed (with two students) by the UNC Charlotte Student Newspaper on RecycleBot, September 9, 2014.
- Interviewed for a podcast (<http://robotspodcast.com>) on the Stiquito Robot, August 8, 2014.
- Interviewed (with many students) by radio station WFAE (Charlotte, NC) on RecycleBot, May 29, 2014.
- Interviewed by WCNC-TV (Charlotte, NC) on the UNC Charlotte Science and Technology Expo, interviewed March 18, 2014, aired March 30, 2014.
- Interviewed by Charlotte News 14 on a story about the death of Neil Armstrong, aired August 26, 2012.
- Interviewed by Charlotte News 14 on a story about the landing of Mars rover Curiosity, aired August 6, 2012.
- Interviewed by Charlotte News 14 on a story about United Technologies Corporation relocating to Charlotte, aired June 13, 2012.
- Interviewed by Charlotte Observer on a story about Summer Camps, published in a special magazine supplement, March 31, 2012.
- Interviewed by WSOC-TV (Charlotte, NC) on a story on the Space Shuttle Program, July 21, 2011.
- Interviewed by WBTV (Charlotte, NC) for the cover story on the Space Shuttle Program, aired July 8, 2011.
- Interviewed by WSOC-TV (Charlotte, NC) on a story on Consumer Product Safety, aired November 2, 2009.
- Quoted on the Senior Design Program, Charlotte Business Journal, January 16, 2009, "Engineering closer links".
- Subject of a story for Charlotte Observer, February 20, 2007, on using electronic toys for engineering education.
- Featured in "A day in the life" website of the UNC System, April 2006, found at: <http://uncfacultyassembly.northcarolina.edu/profiles/Conrad.htm>
- Served as expert of technical background to Gillian Wee, Charlotte Observer, January 8, 2005, "A niche market window: Charlotte circuit board maker embodies specialty firms' expertise, speed, grit."
- Subject of the cover story for Charlotte Observer, September 29, 2004, "Mecklenburg Neighbors" Section, on Stiquito and Education.
- Quoted in Durham Herald-Sun (Durham, NC), August 1, 2004 on Robotics and Artificial Intelligence.

### RECENT CONSULTING ACTIVITIES

- Quantum Partners, consumer product development, January 2015-June 2017.
- White and Case, LLP, Expert Witness for a patent infringement case of a consumer product, November 2014-May 2015. Engaged on behalf of defendant in United States International Trade Commission (ITC) investigation number 337-TA-925.
- Irell and Manella, LLP, Expert Witness for a patent infringement case of a consumer product, October 2013-November 2015. Engaged on behalf of T-Mobile in *On Track Innovations Ltd. v. T-Mobile USA*, No. 12:-CV-224 (AJN) (S.D.N.Y).
- Evatran, LLC, September 2011-March 2012.
- Virtual Incubation Company, Technology Assessment, January 2010.
- Shaw Engineering/UNC Charlotte Continuing Education, Professional Education Assessment, July 2007-January 2008.
- Emerson Electric Company, Embedded System Design Reviewer, Feb 2007-December 2007.
- UNC Charlotte Continuing Education, Project Management Instructor, July 2006-January 2008 (for the general population, Duke Energy, General Dynamics, and Balfour Beatty Construction).
- Admark Graphics Systems, Process Improvement, June-July 2006.
- Womble Carlyle Sandridge & Rice, Expert Witness for a patent infringement case of a consumer product, July 2005-January 2007. Engaged on behalf Netalog, Inc. in *Netalog, Inc. v. Griffin Tech., Inc.*, No. 1:04-CV-00850-WLO (NCMD).
- Nekton Research (now iRobot Marine Division)-Process Improvement, Documentation Tracking, and Software Development, May-December 2005.
- Frontline Test Equipment-Process Improvement, Documentation Tracking, and Software Development, June 2004.
- Intellectual Capital Management Group, Inc. (ICMG)-Wireless Technology Patent Review (Case 1730), January 2004.

### HONORS AND AWARDS

- Nominated for Carnegie Professor of the Year Award 2013.
- UNC Charlotte College of Engineering Undergraduate Award in Teaching Excellence, 2012.
- IEEE-USA Outstanding Service Award, 2012.
- Selected for UNC Charlotte “Advance Leadership Academy,” fall 2010/spring 2011.
- Selected for the Exploration Systems Mission Directorate/Space Grant Consortia Faculty Cohort for the Johnson Space Center, summer 2009.
- Selected for the Exploration Systems Mission Directorate/Space Grant Consortia Faculty Cohort for the Johnson Space Center, summer 2008.
- IEEE Region 3 Outstanding Student Branch Counselor Award 2008 (awarded October 10, 2009).
- UNC Charlotte Lifetime Achievement for Advising Award, awarded by UNC Charlotte Student Organizations, Dean of Students, April 2008.
- IEEE Region 3 Outstanding Educator Award 2007 (awarded March 24, 2007).
- Selected for University faculty attendance stipend to Microsoft Mobile & Embedded DevCon 2006, Las Vegas, May 8-11, 2006 (all expenses paid).
- Selected by UNC Charlotte ECE Department as department representative for College of Engineering Undergraduate Award in Teaching Excellence Award, 2005, 2006, 2012.
- Selected for NSF-funded workshop, “Internship on rapid system prototyping technologies with focus on digital signal processing, artificial neural networks, communications, and instrumentation and control systems,” Pan-American Studies Institute in Cochabamba, Bolivia, June 7-19, 2004.

- Selected for invitation-only NSF Workshop on Wireless Communications, Cincinnati, OH, June 12-14, 1999.
- Outstanding Achievement Award, Ericsson, January 1999 and April 1998.
- Selected for University of Arkansas Teaching Workshop, August 1995 (\$1,000 Stipend).
- University of Arkansas College of Engineering Outstanding Researcher Award, May 1995.
- Selected for NSF Workshop on Logic Synthesis and FPGA Programming, Mississippi State University, Starkville, MS, June 20-25, 1993.
- Selected for Argonne National Laboratory (Department of Energy) Summer Institute in Parallel Programming, Argonne, IL, September 5-15, 1989.
- IBM Resident Study Scholar, August 1988-August 1990.

### **PROFESSIONAL AFFILIATIONS**

- Institute of Electrical and Electronics Engineers, Senior Member (IEEE)
- IEEE Computer, Robotics and Automation, and Education Societies
- IEEE Technical Committees on Computer Architecture, Software Engineering, Parallel Computing, Internet of Things
- Project Management Institute (PMI)
- American Society for Engineering Education (ASEE)
- IEEE-Eta Kappa Nu Electrical Engineering Honor Society