2011 Annual Report

Department of Electrical Engineering and Computer Science
Division of Electrical and Computer Engineering
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Message from the Chair

The year 2012 marks the 45th anniversary of our Electrical Engineering (EE) and Computer Engineering (CpE) programs which were established to offer B.Sc. degrees in 1967. Our Master’s programs were established in 1968, followed by the EE Ph.D. program in 1981 and the CpE Ph.D. program in 1983. In 1992, the EE and CpE departments merged together and became the ECE Dept. When the Computer Science department moved to the College of Engineering, School of EECS was established in 1999. Several administrative re-organizations of EECS occurred afterwards and, since 2010, the current EECS Dept has had two independently-run divisions: ECE and CS. It has been my great honor to serve as the Chair of Electrical and Computer Engineering Division.

An anniversary offers an opportunity to reflect upon the past. Back in 1992-1993, our Department of ECE had 40 tenured/tenure-track faculty members (of which 31 were in EE and 9 were in CpE) and a student population of 851 undergraduates and 294 graduate students, and there were 129 B.S.E.E., 32 BSCpE, 38 M.S.E.E., 12 M.S.CpE, 6 Ph.D.E.E and 1 Ph.D.CpE graduated that year. Twenty years later, ECE Division currently has 26 faculty members (among them 23 are tenured/tenure-track) and a student population of 1324 undergraduates and 301 graduate students and, in the 2011-2012 year, ECE graduated 110 B.S.E.E., 57 BSCpE, 50 MSEE, 24 M.S.CpE, 12 Ph.D.E.E. and 5 Ph.D.CpE. Dedication and productivity of our faculty and staff have been truly exceptional in meeting the needs of our large undergraduate population and very active graduate programs as well as externally funded research. Due to their hard work and persistence, ECE educational and research programs have gained national and international recognitions. In the most recent US News and World Report rankings, our CpE and EE programs are ranked 57th and 62nd, respectively.

Looking forward, ECE faces a number of challenges: our undergraduate enrollment is expected to continue its upward trend, our budget has been constrained by the macro economic conditions, our faculty size needs to become adequate, etc. Fortunately, ECE can count on its top-quality and highly dedicated faculty that include 1 NAE member, 8 IEEE Fellows, 3 NSF CAREER Awardees and 1 DoE Young Investigator Awardee. I would like to take this opportunity to thank my two predecessors, former department chairs Nicolaos Tzannes (1987-1994) and Wasfy Mikhael (1994-1999), as well as former director Issa Batarseh (2004-2010). Their leadership and visions built the department we have today.

I wish to express my sincere gratitude to Dean Marwan Simaan whose leadership has set our college on an ascending trajectory to become one of top engineering colleges in the country and who now returns to ECE after years of administrative service. With his strong support, ECE recently hired 4 new faculty members (including one NSF CAREER awardee) for the next academic year. Our priority remains to hire and retain the best faculty and to continue improving quality of our educational and research programs, and consistent efforts will be directed toward restoring our faculty size to the 2004-2005 level of 39 ECE faculty members.

This special edition of ECE annual report contains a list of our faculty, their expertise and accomplishments in scholarly activities, learning, and technology transfer. With support from our alumni and friends, we will strive to achieve excellence and make ECE the best it can be.

Zhihua Qu, Professor and Chair of ECE

June 30, 2012
### 1.1 Faculty

<table>
<thead>
<tr>
<th>Name</th>
<th>Title/Position</th>
<th>Institution and Year</th>
<th>Research Interests</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issa Batarseh</td>
<td>Professor</td>
<td>Ph.D., Electrical Engineering; University of Illinois at Chicago, 1990</td>
<td>Power Electronics, Energy Conversion and Grid-tied Inverters</td>
<td><a href="mailto:batarseh@eecs.ucf.edu">batarseh@eecs.ucf.edu</a></td>
</tr>
<tr>
<td>Aman Behal</td>
<td>Associate Professor</td>
<td>Ph.D., Electrical Engineering; Clemson University, 2001</td>
<td>Robotics, Neuronal Modeling, Nonlinear Control and Identification, and Visual Servoing</td>
<td><a href="mailto:abehal@eecs.ucf.edu">abehal@eecs.ucf.edu</a></td>
</tr>
<tr>
<td>Ronald F. DeMara</td>
<td>Professor</td>
<td>Ph.D., Computer Engineering; University of Southern California, 1992</td>
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<td><a href="mailto:demara@eecs.ucf.edu">demara@eecs.ucf.edu</a></td>
</tr>
<tr>
<td>Michael Georgiopoulos</td>
<td>Professor</td>
<td>Ph.D., Electrical Engineering University of Connecticut, 1986</td>
<td>Machine Learning, Kernel Machines, Neural Networks, Neuro-Evolution, Pattern Recognition and applications</td>
<td><a href="mailto:michaelg@eecs.ucf.edu">michaelg@eecs.ucf.edu</a></td>
</tr>
<tr>
<td>Xun Gong</td>
<td>Associate Professor</td>
<td>Ph.D., Electrical Engineering; University of Michigan at Ann Arbor, 2005</td>
<td>RF Microwave Millimeter wave Circuits, Integrated 3D High Q Resonators and Filters, Integrated Antennae</td>
<td><a href="mailto:xun.gong@ucf.edu">xun.gong@ucf.edu</a></td>
</tr>
<tr>
<td>Michael Haralambous</td>
<td>Assistant Professor</td>
<td>Ph.D., Electrical Engineering George Washington University, 1978</td>
<td>Robust stabilization and control of certain unstable plants</td>
<td><a href="mailto:michaelh@eecs.ucf.edu">michaelh@eecs.ucf.edu</a></td>
</tr>
<tr>
<td>W. Linwood Jones</td>
<td>Professor</td>
<td>Ph.D., Electrical Engineering; VA Polytechnic Institute &amp; State University, 1971</td>
<td>Remote Sensing, Satellite Communications Systems Engineering</td>
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</tr>
<tr>
<td>Mingjie Lin</td>
<td>Assistant Professor</td>
<td>UC Berkeley, 2008</td>
<td>Computer Architecture/Compiler, Reconfigurable Computing, Integrated Circuit and System Design</td>
<td><a href="mailto:mingjie@eecs.ucf.edu">mingjie@eecs.ucf.edu</a></td>
</tr>
</tbody>
</table>
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Professor  
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Micro nanoelectronics, computer aided design, RF device modeling and simulation  
liou@eecs.ucf.edu

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Digital signal processing, adaptive signal processing, one and multidimensional signal compression  
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Professor and Chair of ECE  
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Microelectronics, optoelectronic materials, thin films micromachining  
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Antenna design and analysis, electromagnetics, microwaves  
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The Harris Corporation Engineering Center
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Linear phase FIR filter design using the Bayesian inference framework, Bayesian Time-Frequency Analysis, Room Acoustics, Landmine Detection
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Lecturer
Ph.D; Electrical Engineering
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Linear phase FIR filter design using the Bayesian inference framework, Bayesian Time-Frequency Analysis, Room Acoustics, Landmine Detection
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Ph.D; Electrical and Computer Engineering
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Robust and Optimal Control of Dynamical System
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Visiting Research Faculty & Joint Faculty

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Faculty Honors

National Science Foundation CAREER Award
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John Shen
Azadeh Vosoughi
Jun Wang

Department of Energy Young Investigator Award
Jun Wang

External Awards and Honors

2011 IEEE Florida Council Outstanding Engineer Award
John Shen

2011 IEEE Orlando Section Outstanding Engineer Award
John Shen

2011 Outstanding Service Award, IEEE Region-3
Kalpathy Sundaram

2012 IEEE Region 3 Outstanding Engineer Award
John Shen
Fellows of Technical & Honor Societies

Marwan Simaan

IEEE Fellows
Issa Batarseh
Linwood Jones
Juin J. Liou
Donald Malocha
Wasfy Mikhael
Zhihua Qu
John Shen
Marwan Simaan

Chair, Professorships and Faculty Fellows

Marwan Simaan, Florida 21st Century Chair Professor
Zhihua Qu, SAIC Professor
Michael Georgiopoulos, Martin/St. Laurent Professor
Xun Gong, CAE Link Faculty Fellow
Mingjie Lin, SAIC Faculty Fellow
Juin J. Liou, Analog Devices Faculty Fellow
Jun Wang, Charles N. Millican Faculty Fellow

Services of Professional Societies

<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>Professional Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aman Behal</td>
<td>• Associate Editor, IEEE Transactions on Systems, Man, and Cybernetics – Part B: Cybernetics</td>
</tr>
<tr>
<td></td>
<td>• Associate Editor, IEEE Transactions on Control Systems Technology</td>
</tr>
<tr>
<td></td>
<td>• Associate Editor, International Journal of Aeronautical and Space Science</td>
</tr>
<tr>
<td></td>
<td>• Associate Editor, Conference Editorial Board, IEEE Control Systems Society</td>
</tr>
<tr>
<td></td>
<td>• Associate Editor, 2012 IEEE/RSJ International Conference on Intelligent Robots and Systems, Vilamoura, Algarve, Portugal</td>
</tr>
<tr>
<td>Michael Georgiopoulos</td>
<td>• Associate Editor of the Neural Networks journal</td>
</tr>
</tbody>
</table>
Xun Gong  
- Journal Editor, IET Microwaves, Antennas & Propagation Special Issue on Advanced Tunable/Reconfigurable and Multi-Function RF/Microwave Filtering Devices, 2013

Juin J. Liou  
- Regional Editor (in USA, Canada and South America), Microelectronics Reliability.  
- Associate Editor, Simulation Journal (VLSI and Circuit Simulation area).  
- Editorial Advisory Board, Microelectronics and Reliability.

Donald Malocha  
- Associate Editor, IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control (UFFC)

Wasfy Mikhael  

Zhihua Qu  
- Associate Editor, International Journal of Robotics and Automation  
- Associate Editor, Automatica, (1999 — present)  

John Shen  
- Guest Editor-in-Chief, Special Issue of Automotive Power Electronics, IEEE Transactions on Power Electronics  
- Editorial Board, International Journal of Electric and Hybrid Electric Vehicles  
- Editorial Board, International Journal of Power Electronics

Parveen Wahid  
- Associate Editor, IEEE AP Magazine  
- Associate Editor, International Journal of Antennas and Propagation  
- Associate Editor, Computer Applications in Engineering Education

Jun Wang  
- Associate Editor for IEEE Transactions on Parallel and Distributed Systems since April 2012

Thomas Wu  
- Electric Machinery Committee Member, IEEE Industrial Applications Society, 2011  
- Editor, Synthesis Lectures on Optics and Photonics, Morgan and Claypool Publishers, (The other Editor is S. T. Wu), 2008 –  
- Editorial Advisory Board, SciTech Publishing Inc., 2007 -  
- Editorial Advisory Board, Journal of Systemics, Cybernetics and Informatics, 2004

Jiann-Shiun Yuan  
- Editor, IEEE Transactions on Device and Materials Reliability
University Honors and Awards

Issa Batarseh and Xun Gong
Michael Georgiopoulos and Wasfy Mikhael
Donald Malocha
Ronald Demara

2011 Research Incentive Award
2011 College of Engineering TIP Award
2011 UCF Pegasus Professors
2011 SOTL

1.2 Staff

Administrative and Technical Staff

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Contact Info</th>
</tr>
</thead>
</table>
| Diana Camerino        | Graduate Program Assistant  | E-Mail: diana@eecs.ucf.edu
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|                       |                             | Office Phone: (407) 823-3027                      |
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ECE Staff

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Contact Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrell Hodges</td>
<td>Senior Information Specialist</td>
<td>E-Mail: <a href="mailto:thodges@eecs.ucf.edu">thodges@eecs.ucf.edu</a></td>
</tr>
</tbody>
</table>
|                       |                             | Office: HEC-346C
|                       |                             | Office Phone: (407) 823-4587                      |
| Melissa Occil         | Coordinator, Administrative Services | E-Mail: moccil@eecs.ucf.edu |
|                       |                             | Office: HEC-439A
|                       |                             | Office Phone: (407) 823-5942                      |
Honors and Awards

Steven Freund  
Spring 2011 Employee of the Semester

2. Academic Programs

2.1 Enrollment and Degrees Awarded

B.S.E.E. & BScP.E

The mission of the Department of Electrical Engineering and Computer Science is to educate undergraduate and graduate students to become highly skilled in the principles and practices of computer engineering (CpE) and electrical engineering (EE). The Electrical Engineering Program is to develop and disseminate the theory and methods for the design, analysis, and implementation of the principles and practices in Electrical Engineering; and Computer Engineering Program is to develop and disseminate the theory and methods for the design, analysis, implementation, and improvement of computer hardware, software, and systems.

Enrollment in ECE Division undergraduate programs for Fall 2011 totaled 1274 students as listed below:

- B.S.E.E. Enrollment = 722
- BScP.E Enrollment = 552

The chart below shows undergraduate enrollment in EE and CpE starting Fall 2007 – Fall 2012.
The ECE Division awarded 110 B.S.E.E. and 57 BSCpE as listed below:

- B.S.E.E.: Degrees Awarded = 110
- BSCpE: Degrees Awarded = 57

Total Undergraduate Degrees awarded in ECE = 167

The chart below shows the degrees awarded for EE, CpE and CS from AY 2008 – 2012.

Fall 2011 Enrollment in ECE Division graduate programs totaled 301 students as listed below:

- MSEE Enrollment = 96
- MS CpE Enrollment = 44
- Ph.D. EE Enrollment = 120
- Ph.D. CpE Enrollment = 41
The chart below shows Graduate enrollment in EE and CpE starting Fall 2007 – Fall 2011.

Graduate Enrollment

The ECE Division awarded 74 Masters degrees and 17 Ph.D. degrees as listed below:

- M.S.E.E: Degrees Awarded = 50
- M.S.CpE: Degrees Awarded = 24

Total Masters Degrees awarded in ECE = 74

- Ph.D.E.E Degrees Awarded = 12
  - Ph.D.CpE: Degrees Awarded = 5

Total Ph.D. Degrees awarded in ECE = 17

M.Sc. Degrees Awarded

The chart below shows M.Sc. Degrees conferred from AY 2008-2012.
The chart below shows Ph.D. Degrees Conferred from AY 2008-2012.
### 2.2 Courses Taught

<table>
<thead>
<tr>
<th>Core Courses</th>
<th>Course Title</th>
<th>Professor/Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEL3004</td>
<td>ELECTRICAL NETWORKS</td>
<td>FAHIM</td>
</tr>
<tr>
<td>EEL3004</td>
<td>ELECTRICAL NETWORKS</td>
<td>CHAN</td>
</tr>
<tr>
<td>EEL3004</td>
<td>ELECTRICAL NETWORKS</td>
<td>GONG</td>
</tr>
<tr>
<td>EEL3041</td>
<td>CIRCUIT ANALYSIS</td>
<td>SHEN</td>
</tr>
<tr>
<td>EGN3060C</td>
<td>INTRODUCTION TO ROBOTICS</td>
<td>SUKTHANKAR</td>
</tr>
<tr>
<td>EEL3123C</td>
<td>NETWORKS AND SYSTEMS</td>
<td>BEHAL</td>
</tr>
<tr>
<td>EEL3123C</td>
<td>NETWORKS AND SYSTEMS</td>
<td>HARALAMBOUS</td>
</tr>
<tr>
<td>EEE3307C</td>
<td>ELECTRONICS I</td>
<td>CHAN</td>
</tr>
<tr>
<td>EEE3342C</td>
<td>DIGITAL SYSTEMS</td>
<td>BHUTTA</td>
</tr>
<tr>
<td>EEE3342C</td>
<td>DIGITAL SYSTEMS</td>
<td>ABICHAR</td>
</tr>
<tr>
<td>EEE3350</td>
<td>SEMICONDUCTOR DEVICES I</td>
<td>SALDANHA</td>
</tr>
<tr>
<td>EEE3350</td>
<td>SEMICONDUCTOR DEVICES I</td>
<td>ELASHHAB</td>
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<tr>
<td>EGN3373</td>
<td>PRINCIPLES OF ELECTRICAL ENG</td>
<td>FAHIM</td>
</tr>
<tr>
<td>EGN3420</td>
<td>ENGINEERING ANALYSIS</td>
<td>BAUER</td>
</tr>
<tr>
<td>EEL3470</td>
<td>ELECTROMAGNETIC FIELDS</td>
<td>WU</td>
</tr>
<tr>
<td>EEL3552C</td>
<td>ANALOG &amp; DIGITAL COM FUND</td>
<td>WEI</td>
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<tr>
<td>EEL3657</td>
<td>LINEAR CONTROL SYSTEMS</td>
<td>HARALAMBOUS</td>
</tr>
<tr>
<td>EEL3801C</td>
<td>COMPUTER ORGANIZATION</td>
<td>DEMARA</td>
</tr>
<tr>
<td>EEL4140C</td>
<td>ANALOG FILTER DESIGN</td>
<td>MIKHAEL</td>
</tr>
<tr>
<td>EEL4205</td>
<td>ELECTRIC MACHINERY</td>
<td>ELASHHAB</td>
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<td>EEE4309C</td>
<td>ELECTRONICS II</td>
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<tr>
<td>EEE4314</td>
<td>DEVICE ELECT INTERGR CIRCUITS</td>
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<td>GONG</td>
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<td>WU, S.</td>
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<tr>
<td>EEL4750</td>
<td>DIGITAL SIGNAL PROCESSING FUND</td>
<td>MIKHAEL</td>
</tr>
<tr>
<td>EEL4768C</td>
<td>COMPUTER ARCHITECTURE</td>
<td>ABICHAR</td>
</tr>
</tbody>
</table>
Ph.D. Dissertations during the Academic Year 2011 – 2012 reporting period are listed below:

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Advisor</th>
<th>Dissertation Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ala Al Haj Hussein</td>
<td>Issa Batarseh</td>
<td>Design and Operation of Stationary Distributed Battery Micro-Storage Systems</td>
</tr>
<tr>
<td>Zhao Wang</td>
<td>Aman Behal</td>
<td>Lyapunov-Based Control Design for Uncertain MIMO Systems</td>
</tr>
<tr>
<td>Mukundan Iyengar</td>
<td>Mainak Chatterjee</td>
<td>Measuring and Improving Internet Video Quality of Experience</td>
</tr>
<tr>
<td>Rawad Al-Hadda</td>
<td>Ronald DeMara</td>
<td>An Adaptive Modular Redundancy Technique to Self-Regulate Availability, Area, and Energy Consumption in Mission-Critical Applications</td>
</tr>
<tr>
<td>Rashad Oreifej</td>
<td>Ronald DeMara</td>
<td>A Sustainable Autonomic Architecture for Organically Reconfigurable Computing Systems</td>
</tr>
<tr>
<td>Yazid Yusuf</td>
<td>Xun Gong</td>
<td>A Microwave Radiometer Roughness Correction Algorithm for Aquarius</td>
</tr>
<tr>
<td>Abhijit Wakchaure</td>
<td>Kien Hua</td>
<td>&quot;Exploring Techniques for Measurement and Improvement of Data Quality with Application to Determination of the Last Known Position (LKP) in Search and Rescue (SAR) Data&quot;</td>
</tr>
<tr>
<td>William Junek</td>
<td>W Linwood Jones</td>
<td>Forecasting Volcanic Activity Using an Event Tree Analysis System and Logistic Regression</td>
</tr>
<tr>
<td>Sayak Biswas</td>
<td>W Linwood Jones</td>
<td>Brightness Temperature Calibration of Aquarius/SAC-D Microwave Radiometer (MWR)</td>
</tr>
<tr>
<td>Xiang</td>
<td>Juin Liou</td>
<td>Characterization, Modeling, Simulation and Reliability</td>
</tr>
</tbody>
</table>
MS Theses during the reporting period are listed below:

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Advisor</th>
<th>Dissertation Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jose Suarez</td>
<td>Aman Behal</td>
<td>Data-True Characterization of Neuronal Models</td>
</tr>
<tr>
<td>Zhao Wang</td>
<td>Aman Behal</td>
<td>Nonlinear Estimation and Control for Assistive Robots</td>
</tr>
<tr>
<td>Carl Messina</td>
<td>Hassan Foroosh</td>
<td>Labeled SAMpling Consensus (L-SAC): A Novel Method for Detecting Multiple Structures in a Dataset</td>
</tr>
<tr>
<td>Jacob Staples</td>
<td>Mark Heinrich</td>
<td>Power Efficient Run Time Adaptive Processor Design</td>
</tr>
<tr>
<td>Rami Jadaa</td>
<td>Mark Heinrich</td>
<td>Dynamic Mapping Schemes in Active MC Design</td>
</tr>
<tr>
<td>Yazan Hajazin</td>
<td>W Linwood Jones</td>
<td>A Microwave Radiometer Roughness Correction Algorithm for Sea Surface Salinity Retrieval</td>
</tr>
<tr>
<td>Catherine May</td>
<td>W Linwood Jones</td>
<td>Engineering Evaluation of Multi-Beam Satellite Antenna</td>
</tr>
<tr>
<td>Rosa Gonzalez</td>
<td>W Linwood Jones</td>
<td>Rain Rate Retrieval Algorithm for Aquarius/SAC-D Microwave Radiometer</td>
</tr>
<tr>
<td>Maxim Troshin</td>
<td>Donald Malocha</td>
<td>Synchronous Frequency Adjustable Programmable Communication System for Saw Sensors Interrogation</td>
</tr>
<tr>
<td>Adarsh Nagaraja</td>
<td>Marshall Tappen</td>
<td>Feature Pruning for Action Recognition in Complex Environment</td>
</tr>
<tr>
<td>Jose Suarez</td>
<td>Jiann-Shiun Yuan</td>
<td>Investigation and Trade Study on Hot Carrier Reliability of the PHEMT for DC and RF Performance</td>
</tr>
<tr>
<td>Giji Skaria</td>
<td>Jiann-Shiun Yuan</td>
<td>Class-F and Inverse Class-F Power Amplifiers Subject to Electrical Stress Effect</td>
</tr>
<tr>
<td>Allen Gibson</td>
<td>Jiann-Shiun Yuan</td>
<td>Radio Frequency Mixers</td>
</tr>
</tbody>
</table>

2.4 Student Awards Received

**Paper Award**

- J. Luther, Best Student Research Presentation in 2011 WAMICON
- J. Luther, Student Paper Competition Honorable Mention Award in 2011 AP-S/URSI Int. Symp.

**Scholarship Award**

- Omar Oreifej (Ph.D.CpE) – Arab American Community Center/Kamal Marchi Scholarship $1500
- Andrea Solano (B.S.E.E.) – AT&T Wireless Endowed Scholarship - $1500
- Steven Kobosko (B.S.E.E.) – Boeing Scholarship - $2000
- Joseph Nichols (B.S.E.E.) – Boeing Scholarship - $2000
- Matthew Webb (B.S.E.E.) – Boeing Scholarship - $2000
- Marcial Rosario (B.S.E.E.) – CECS Alumni Scholarship - $1000
- Tejas Bhandare (B.S.E.E.) – Daniel D. Hammond Engineering Scholarship - $1000
- Brian Millikan (B.S.E.E.) – Daniel D. Hammond Engineering Scholarship - $1000
- Elizabeth Vargas (B.S.E.E.) – Daniel D. Hammond Engineering Scholarship - $1000
- Larry Schneider (Ph.D.E.E.) – David T. & Jane M. Donaldson Memorial Scholarship - $2500
- Skyeer Goodell (BScpE) – Frank Hubbard Engineering Scholarship - $1000
- Wen Liu (M.S.E.E.) – Frank Hubbard Engineering Scholarship - $1000
- Taylor Steward (B.S.E.E.) – Frank Hubbard Engineering Scholarship - $1000
- Shuyu Chen (Ph.D.E.E.) – IEEE Orlando Section Graduate Student Scholarship
- Ross Kerley (B.S.E.E.) – Lockheed Martin Club Scholarship - $500
- Ernest Davidson (B.S.E.E.) – Progress Energy Scholarship - $1000
- Amber Scheurer (B.S.E.E.) – Progress Energy Scholarship - $1000
- Benjamin Goolsby (B.S.E.E.) – Richard Miller Scholarship - $1000
- Martin Trang (B.S.E.E.) – SAME Space Coast Scholarship - $2500

2.5 COURSE & PROGRAM DEVELOPMENT

The following are Course and Program changes during the calendar year 2011 – 2012.

Undergraduate Education

The department updated a few undergraduate course prerequisite for CY 2011, please see the following below:

Updated BME 5572 prerequisite from EEE 3350 to EEE 3307C
Updated EEL 3123C prerequisite from EEL 3004 to EEL 3004 and MAP 2302 with a “C” (2.0) or better grade will be required
Updated EEL 4750 prerequisite from EEL 3552C to EEL 3213C
Updated EEL 4781 prerequisite from EEL 4742C to EEL 3801C
Updated EEE 3350 prerequisite from EEL 3004 to EEL 3004 and PHY 3101

The lab committee updated lab manuals and experiments for the following courses:

Updated EEL4742C – Embedded Systems course and laboratory equipment and experiments
Updated Laboratory Experiments and Manuals for the following:
EEL 3123C – Networks and Systems
EEE 3307C – Electronics I
EEE 4309C – Electronics II
EEL 3552C – Analog and Digital Communications

Significant changes in degree requirement are the following:

Removed EGN 3420 – Engineering Analysis from B.S.E.E. degree requirements
Added EGN 3211 – Engineering Analysis and Computation to B.S.E.E. and B.S.CpE degree requirements
In order to add EGN 3211, CpE degree program technical elective hours are now 6 (from 9), which was the same prior to the degree revisions in 2008
COP 3223 is no longer required by EE and CpE majors, but EGN 3211 is accepted as a substitute for courses requiring COP 3223 as a prerequisite

Curriculum description changes:

- **EGN 3211 ECS-ECE 3(3,0) Engineering Analysis and Computation: PR: MAC 2312.** Engineering analysis and computation with structured constructs. Subscripted variables, functions, input/output. Applications in embedded systems and examples in numerical methods. Fall, Spring.
- **EGN 3420 ECS-ECE 3(3,0) Engineering Analysis: PR: High-level computer language; MAC 2312.** Engineering applications of numerical methods including curve fitting, matrix operations, root finding, interpolating, integration and plotting. Fall, Spring.
- All Engineering students now enter as Engineering Pending as of Summer 2012. After success in Calculus II and Physics for Engineers and Scientists I, they may apply for regular engineering status.
## 2.6 Instructional Laboratories

### Teaching Laboratories

**Undergraduate/Graduate ECE Teaching Laboratories:**

<table>
<thead>
<tr>
<th>Name of Lab</th>
<th>Course Name</th>
<th>Location</th>
<th>Square Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Laboratory</td>
<td>EEL3552, EEL4140, EEL4515</td>
<td>ENG I 471</td>
<td>959sf</td>
</tr>
<tr>
<td>Computer Systems Laboratory</td>
<td>EEL3801, EEL4768</td>
<td>HEC 338</td>
<td></td>
</tr>
<tr>
<td>Digital Circuit Laboratory</td>
<td>EEE3342, EEL4742</td>
<td>ENG I 257</td>
<td>1605sf</td>
</tr>
<tr>
<td>Electronics Laboratory</td>
<td>EEL3123, EEL3307, EEL4309</td>
<td>ENG I 474</td>
<td>1305sf</td>
</tr>
<tr>
<td>Microwave Laboratory</td>
<td>EEL 4436, EEL 5437, EEL 5439, EEL 6425</td>
<td>ENG I 461</td>
<td>1305sf</td>
</tr>
<tr>
<td>Senior Design Laboratory</td>
<td>EEL 4914, EEL 4915</td>
<td>ENG I 456</td>
<td>1710sf</td>
</tr>
<tr>
<td>Medical Robotics Laboratory</td>
<td>EEL5690</td>
<td>HEC 302</td>
<td></td>
</tr>
<tr>
<td>ECE PC Laboratory</td>
<td></td>
<td>ENG I 274</td>
<td>1570sf</td>
</tr>
<tr>
<td>Cleanroom</td>
<td>EEL 5332, EEL 5355, EEL 5356</td>
<td>ENG I 163</td>
<td>1225sf</td>
</tr>
<tr>
<td>Microfabrication and Electronic</td>
<td></td>
<td>ENG I 119-120</td>
<td>154sf</td>
</tr>
<tr>
<td>Device Test Facility</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## 2.7 Lectures and Seminars

<table>
<thead>
<tr>
<th>Guest Speaker</th>
<th>From</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lawrence Carin</td>
<td>Duke University</td>
<td>Exploiting Low-Dimensional Structure in Image and Video Analysis</td>
</tr>
<tr>
<td>Charvaka Duvvury</td>
<td>Texas Instruments</td>
<td>Future ESD Challenges for IC Components and Systems</td>
</tr>
<tr>
<td>Wu-chun Feng</td>
<td>Virginia Tech</td>
<td>An Ecosystem for Heterogeneous Parallel Computing</td>
</tr>
<tr>
<td>Shaolei Ren</td>
<td>UCLA</td>
<td>Exploiting Heterogeneity for Greening Data Centers</td>
</tr>
<tr>
<td>Himanshu Thapliyal</td>
<td>Duke University</td>
<td>Reversible Logic: Fundamentals and Applications in Emerging Nanotechnologies</td>
</tr>
<tr>
<td>Miao Zhao</td>
<td>Huawei Technologies</td>
<td>Design and Optimization on Mobile Data Gathering in Wireless Sensor Networks</td>
</tr>
<tr>
<td>Nikolaos Gatsis</td>
<td>University of Minnesota</td>
<td>Resource Management for Wireless Networks and the Smart Power Grid</td>
</tr>
<tr>
<td>Tor. A. Fjeldly</td>
<td>Fellow of IEEE and Member of the Norwegian Academy of Technical Sciences</td>
<td>Physics Based Modeling of Nanoscale Multigate MOSFETs</td>
</tr>
<tr>
<td>Wei Liu</td>
<td>University of Sheffield</td>
<td>Blind Wideband Beamforming Based on Frequency Invariant Transformation</td>
</tr>
<tr>
<td>Ming Yu</td>
<td>Com Dev, Cambridge, Ontario, Canada</td>
<td>Shrinking Microwave Filters</td>
</tr>
<tr>
<td>Azadeh Vosoughi</td>
<td>University of Rochester</td>
<td>From Advanced Wireless Communications to Human Auditory</td>
</tr>
</tbody>
</table>
IEEE Electron Device Society

On March 20th, 2012, IEEE Orlando Section EDS Chapter and IEEE UCF Student Branch held an IEEE Electron Devices Colloquium 2012 in HEC 101 from 8:30-12:20 and 2:20-4:40pm in Eng II 202A. The technical program consisted of seven talks given by internationally recognized lecturers in the field of electron devices. The topics included recent development of electron device physics and modeling, electrostatic discharge protection device and circuit design, reliability and fabrication for advanced technologies.

3. Research

3.1 Areas of Research

Computer Systems and VLSI
- Data-intensive High Performance Computing, Massive Storage and File System, I/O Architecture
- Computer Architecture and Evolvable Hardware
- Secure, Trusted, and Reliable Processor and ASIC Design; Cyber Security and Cryptography

Cyber-Physical Systems (Communication, Controls, Signal Processing, and Energy Systems)
- Networked Systems, Cooperative Control, Optimization and Games
- Autonomous Robotic Vehicles, Medical and Assistive Robotics
- Smart Grids, Distributed Generation and Optimization, Protection and Control
- Biomedical Devices and Control
Electromagnetics
- Remote Sensing, Satellite Communications
- Microwave Sensors, Antennas, Phased Arrays and Integrated RF

Micro- and Nano-Systems
- Power electronics, Power Semiconductor devices and ICs
- Optoelectronic Materials, Thin Films Micromachining

3.2 Research Laboratories

Antennas and Microwave Laboratory – HEC 428 & HEC 431
Xun Gong and Parveen Wahid
At ARMI Laboratory, we are performing research in applied electromagnetics and microwave engineering. We have active projects on the development of novel low-profile wireless sensors for harsh environment applications. Our research interests also include phased array antennas and beamsteerable reflectarray antennas. We have been one of the pioneers in developing integrated filter/antennas and endeavor to further advance this technology. Finally, tunable and flexible microwave devices such as phase shifters, filters and antennas are under development at ARMI Laboratory to be employed in the next-generation conformal and deployable telecommunications systems.

Center for Advanced Electric Machinery – HEC 203
Thomas Wu
We focus on investigating advanced electric machinery for aerospace, industry, geology, medical and defense applications. Ongoing projects include high power density aircraft synchronous generator, switch reluctance motor for renewable energy system, high temperature permanent magnet motor, super high speed electric machine, low cost ultra-compact micro inverter, high performance electromechanical actuator, etc.

Assistive Robotics Lab – Research Pavilion 494
Aman Behal
Research is focused on the development of novel human-robot interface (HRI) designs to facilitate ADL (activities of daily living) tasks for individuals in wheelchairs navigating through arbitrary unstructured environments.

Computer Systems & Architecture Laboratory - HEC 242
In the Computer Systems and Architecture Laboratory, we are performing research in Reprogrammable Logic Devices, Evolvable Hardware, Multicore Processors, and Hardware Security. Research in Reprogrammable Logic Devices and Evolvable Hardware is focused on autonomously reconfigurable Field Programmable Gate Arrays (FPGA) devices in applications including signal processing and mission-critical processing systems. Novel FPGA architectural concepts are being developed to achieve survivability while sustaining nominal run-time throughput, despite unanticipated device defects using Adaptive Group Testing, Resource Fitness Escalation, and Consensus techniques. Multicore computer architecture research is focused on memory and cache protocols and their performance, multiprocessor simulation methodologies. It also covers hardware/software co-design ranging from mobile and low-power architectures such as Energy-efficient Embedded Computing to Scalable Web Services. Hardware Security research is focused on hardware Trojan Detection in digital and mixed-signal designs such as Wireless Cryptographic ICs. Resources range from FPGA development boards to Berkeley Emulation Engine testbeds, servers, and simulation tools.

Controls Laboratory – HEC 434  
Zhihua Qu, Marwan Simaan, and Michael Haralambous

The 400-sf Controls Laboratory, housed at HEC 434, conducts research in optimization and controls of cyber-physical systems. Topics include identification of dynamic systems, estimation of distributed networks, distributed cooperative control of nonlinear heterogeneous systems, distributed game algorithms, and optimization of network topologies. Applications include biomedical devices, autonomous vehicle systems, solar-energy grid-tied systems, smart grids, and energy systems.

Digital Signal Processing Laboratory – HEC 342  
Wasfy Mikhael, Zhihua Qu, Marwan Simaan and Arthur Weeks

Research is conducted in digital signal processing of one and multidimensional signals and systems. Topics include Adaptive signal processing with communications applications such as IQ mismatch compensation, adaptive beam forming, channel identification, noise cancellation, etc…., efficient feature extraction of speech and image signals with applications such as signal compression, model and transform based signal representation, facial recognition, speaker Recognition, human action recognition, etc…., sparse signal processing with applications such as compressive sensing, network tomography, group testing, etc… and adaptive algorithms for real and complex signal and systems with applications such as error correction in interleaved analog to digital converters, interference suppression, signal separation, signal enhancement, etc….

Intelligent Systems Laboratory – HEC 331  
Michael Georgiopoulos

The Intelligent Systems Laboratory, or ISL, represents a group of faculty and students undertaking high quality research in intelligent systems. The ISL is part of the School of Electrical Engineering and Computer Science at the University of Central Florida in Orlando, FL. We take a broad interpretation of the term intelligent, but the large majority of our work involves artificial intelligence and all the technologies derived therefrom. Our focus is in using such technologies to build systems that encompass both hardware and software, and are of practical use in human endeavors.

Micro/Nanoelectronics Laboratory – HEC 401  
Juin J. Liou

Electrostatic discharge (ESD) is an event in which a finite amount of charge is transferred from one object to the other. The electrostatic charge generation results from either the triboelectrification process (i.e., transfer of electrons when
two different materials are in contact) or the inductive process (i.e., separation of positive and negative charges due to an electric field). If a microchip or electronic system is subject to the ESD, then the huge current associated with the ESD event can likely damage the microchip and cause malfunction to the electronic system. It is estimated that about 35% of all damaged microchips are ESD related, resulting in a loss of revenue of several hundred million dollars in the global semiconductor industry every year.

The Micro/Nanoelectronics Laboratory at UCF has been working on ESD research work for more than 15 years, and the lab possesses several ESD specific equipment which can be used to conduct the testing and characterization of ESD protection structures. The group is aiming to design and implement effective and robust ESD protection solutions in Si CMOS, Si BiCMOS, SiGe, GaAs, and emerging technologies. Current industry partners include Analog Devices, Intersil, Maxim, and National Semiconductor.

Nano/MEMS Laboratory – HEC 406
Kalpathy Sundaram

This laboratory is devoted to thin film materials and nano/microelectronic device characterization. Materials characterization focuses on optical properties of thin films using a Varian UV-Visible spectrophotometer. Resistivity studies of thin films can be performed from low temperature (20 K) to high temperatures up to 523 K. Device characterization include MOS CV and I-V studies using HP dedicated systems.

Nanoelectronics Reliability Laboratory – HEC 425
Jiann S. Yuan

The Nanoelectronics Reliability Laboratory is actively engaged in research of CMOS device and circuit reliability. Our radio-frequency integrated circuit design addresses device physics and reliability issues in the circuit operation environment. Process variability, temperature fluctuation, and supply voltage variations are accounted for in the design of wireless transceiver circuits, such as low noise amplifiers, voltage-controlled oscillators, and power amplifiers.

Power Semiconductor Research Laboratory – HEC 404
John Shen

Our Power Semiconductor Research Laboratory (PSRL), as an integral part of the Florida Power Electronics Center (FPEC) at UCF, is actively engaged in research and development of ultra-low gate charge lateral power MOSFETs for MHz-frequency DC/DC converters; high-voltage super-junction power devices for power supply and motor drive applications; smart power devices with integrated functions; SiC and other wide bandgap semiconductor devices; advanced power device packaging; prognostics functions of power electronics modules for electric vehicles; and many other projects in power electronics and automotive electronics. We often address device issues with an innovative systems approach that leverages our knowledge both in solid state physics and power electronic systems, as well as existing semiconductor manufacturing infrastructures.

Florida Power Electronics Center – Research Park
Issa Batarseh and John Shen

The Center's mission is to develop advanced energy conversion technologies for solar and other renewable sources through multidisciplinary engineering research and education in the field of power electronics. The research vision is to achieve significant improvements in power density, efficiency, reliability, and cost-effectiveness of electric energy processing systems by developing innovative topology and control techniques, power semiconductor devices, passive components, and packaging and system integration techniques.

Remote Sensing Laboratory – HEC 349
W. Linwood Jones

The Central Florida Remote Sensing Laboratory of the Electrical & Computer Engineering Department performs state-of-the-art research in the field of microwave remote sensing of atmosphere, ocean and land geophysical parameters. As
electrical engineers, we participate in the development of advanced microwave remote sensing instruments and measurement techniques for the National Aeronautics and Space Administration (NASA), other federal governmental agencies and the U.S. aerospace industry. These microwave sensors have applications for environmental monitoring from earth-based, airborne and satellite platforms. Also, we participate on international science teams to develop geophysical data interpretation algorithms using the electrical engineering principles of electromagnetic fields theory, communications theory and digital signal processing. Current satellite remote sensing projects are: Ocean Vector Wind Science Team, Precipitation Measurements Mission Science Team, and Sea Surface Salinity Science Team.

Robotics Laboratory – EGN I 364
Zhihua Qu

The 400-sf Robotics Laboratory, housed at ENG I 364, conducts research in robotic manipulation, motion planning, and control. Topics include cooperative control of unmanned vehicles, teleoperation, coverage control, and novel energy-harvesting devices. Applications include medical surgical robots, mobile robotic platforms, and ocean wave energy generation devices.

Signals and Communication Laboratory – HEC 334
Lei Wei and Michael Georgiopoulos

The Advanced Communication Laboratory at Department of Electrical and Computer Engineering, The University of Central Florida, conducts researches in the areas of Wireless Communications, Emergency Communications, Error Control Coding, and Application of advanced coding theory in Bio-inspired system design, called General Purpose Representation and Association Machine (GPRAM). The Lab obtained funds from various sources, including NSF, US Homeland Security Department, FDOE, NASA/FSGC, US ARMY. Currently, his group is fully focusing on GPRAM machine prototype development.

Software Systems – HEC 231
Jun Wang

Our Computer Architecture and Storage System (CASS) laboratory has primary research interests which cover a wide spectrum in the areas of high performance and computer systems. A common thread among our research projects focuses on fast data accesses and resource sharing with cost- and energy-efficient management at different levels of memory and storage hierarchies in supercomputer, parallel and distributed computer systems. More recently, CASS research interests cover the areas of interdisciplinary computing, computer architecture, and low-power computing. A significant complimentary thread among CASS extensive research projects emphasize at developing new software tools and hardware platforms to stimulate advances in science and engineering research, where large digital data collections are increasingly prevalent. CASS research projects have been sponsored by several federal funding agencies such as National Science Foundation, Department of Energy, and NASA. In the last five years, the total amount of research funding is approximately $3.03M.

Solid State Devices Laboratory – EGN I 234
Donald Malocha

The solid state devices and systems laboratory (SSDSL) performs experimental and solid-state research in a broad range of technologies. The laboratory has been operational for over 25 years and has established a network of partnerships with industry and government groups. The laboratory has facilities for RF device probing for characterization in the 100 kHz to 6 GHz range, various vector and scaler analyzers, printed circuit board design and fabrication, wafer dicing and die bonding, and custom analysis, design, synthesis and measurement computer systems. The research emphasis of the laboratory is in solid-state bulk and surface acoustic wave technology for communication and sensors. In 2000, we were the 1st US group to fully characterize LGS, LGN and LGT piezoelectric material parameters over temperature, the group has invented and patented embodiments of RF orthogonal frequency coded (OFC) SAW tag and sensors, and is continuing research on passive wireless system and technology solutions for sensors. In conjunction with ECE’s microfabrication facilities, submicron devices can be produced, from mask to packaging, in a quick turn-around capability. Devices can then be fully characterized, tested, packaged and integrated into a wireless test system.
Advanced Microfabrication Support Laboratory – EGN I 122
Donald Malocha and Kalpathy Sundaram

This is a small laboratory used for prototyping and device integration. The laboratory can build small packages, test fixtures, microblasting of wafers. The room also provides support for repair and maintenance of the ECE cleanroom facility.

3.3 Publications

Books


Book Chapters


Journal Publications


Conference Papers


### Conference Articles without Proceedings


**Plenary and Invited Talks**


**Patents**


Ge, Z., X. Zhu, S. T. Wu, and T. X. Wu, Liquid crystal display device having patterned electrodes for repetitive divided horizontal electric field and fringing electric field, U. S. 7,932,980, issued April 26, 2011


**Disclosures**


Batarseh, I. - Interactive Electronic Book Operating Systems and Methods, Filed on September 11, 2008, App. # 20080222552

Batarseh, I. - Symbolic Switch/Linear Circuit simulator (SymCir), Filed on February 21, 2007.

### 3.4 Research Funding

#### ECE TOTAL RESEARCH FUNDING CY 2011

<table>
<thead>
<tr>
<th>Funded</th>
<th>Title</th>
<th>PI</th>
<th>Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>$266,000</td>
<td>Photovoltaic Power Electronics Research</td>
<td>Batarseh</td>
<td>US Dept of Energy</td>
</tr>
<tr>
<td>$17,297</td>
<td>Non-Linear Characterization of the Stretch Reflex Arc and its Neuromodulatoin</td>
<td>Behal</td>
<td>NIH</td>
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<tr>
<td>$84,000</td>
<td>REU Supplement to Collaborative Research: Towards Life-like Computer Interfaces that Learn</td>
<td>DeMara</td>
<td>NSF</td>
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<tr>
<td>$452,525</td>
<td>CRPA: Communicating Avatars: Artificial Intelligence + Computer Graphics = Innovative Science</td>
<td>Georgiopoulos</td>
<td>Workforce Central Florida</td>
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<td>$485,722</td>
<td>Inter-Satellite Radiometric Calibration for the GPM Constellation</td>
<td>Jones</td>
<td>NASA</td>
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<tr>
<td></td>
<td>Observations of Ocean Surface Wind Speed and Rain Rate with the Hurricane Imaging Radiometer (HIRAD)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Improved Aquarius Salinity Retrievals using Auxiliary Products from the Microwave Radiometer</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Improved Active/Passive Ocean Vector Wind Retrievals</td>
<td></td>
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<tr>
<td></td>
<td>GOLD SALMON project</td>
<td></td>
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<tr>
<td>$100,000</td>
<td>Design, Characterization, and Optimization of High Voltage (20 to 70 volts) Electrostatic Discharge (ESD) Protection Elements for Power Management Integrated Circuits</td>
<td>Liou</td>
<td>Intersil Corporation</td>
</tr>
<tr>
<td></td>
<td>RF - Development of Standardized Methodology to Correlate System ESD Pulses at Connector to ESD Pulses at IC to Enable IC Design</td>
<td></td>
<td>National Semiconductor Corp.</td>
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<tr>
<td>$173,243</td>
<td>OFC SAW tag/sensor</td>
<td>Malocha</td>
<td>NASA</td>
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<tr>
<td></td>
<td>SAW Sensor Parameter Detection Using Coherence Techniques</td>
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<td>FSGC</td>
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<td></td>
<td>NASA SBIR Phase I: Wireless SAW Interrogator and Sensor System</td>
<td></td>
<td>Mnemonics, Inc.</td>
</tr>
<tr>
<td>Project Title</td>
<td>Funding Agency</td>
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<tr>
<td>------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>NASA STTR Phase 1: Wireless SAW Sensor Strain Gage &amp; Integrated Interrogator Design</td>
<td>UCF FHTC</td>
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<td>SAW OFC Device Fabrication on YZ Lithium Niobate</td>
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<td>NASA SBIR Phase I: High Temperature SAW Sensor Development</td>
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<td>Wireless, Passive Strain Sensor for Space Applications - Graduate Student Researchers Program (GSRP): James Humphries</td>
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<td>I-4: Wireless SAW Interrogator and Sensor System</td>
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<td>University of Central Florida and Harris Corporation Joint Senior Design Wave Energy Projects</td>
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<td>Grid Stability with Distributed Generations and Varying Topologies</td>
<td>DOE SEGIS</td>
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<td>Modeling and Control of Unmanned Aerial Vehicles</td>
<td>L3 Communications Link Simulation &amp; Training</td>
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<td>I-4: Unmanned Aircraft System Operations in National Air Space: A Feasibility Study at Daytona Beach International Airport</td>
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<td>Autonomous and Cooperative Control of Unmanned Air Systems</td>
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<td>I-4: Modeling and Control of Unmanned Aerial Vehicles</td>
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<td>Photovoltaic Power Electronics Research Initiative (PERI) for developing low cost, ultra-compact, three-phase micro inverters or “AC bricks”</td>
<td>US Dept of Energy</td>
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<td>Student Support - Boyi Yang</td>
<td>Texas Instruments</td>
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<td>NASA SBIR Phase II: High-Temperature, Wirebondless, Ultra-Compact Wide Bandgap Power Semiconductor Modules for Space Power Systems</td>
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<td>I4: NASA SBIR Phase II: High-Temperature, Wirebondless, Ultra-Compact Wide Bandgap Power Semiconductor Modules for Space Power Systems</td>
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<td>RF: Preparation of Boron Carbon Nitride (BCN) films by RF Sputtering using dual target approach</td>
<td>Intel Corp.</td>
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<td>Amorphous Ferromagnetic Alloys</td>
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<td>CAREER: Data-Intensive HPC Analytics: A systems approach through extended interfaces, data restructuring and data-centric scheduling</td>
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<td>CSR: Small: DSA-Cloud: Data Semantics Aware Clouds for High Performance Analytics</td>
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<td>GOLD SALMON project</td>
<td>NASA</td>
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<td>Photovoltaic Power Electronics Research Initiative (PERI) for developing low cost, ultra-compact, three-phase micro inverters or “AC bricks”</td>
<td>US Dept of Energy</td>
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<td>Induced Power System Simulation Model Project</td>
<td>Siemens Energy, Inc.</td>
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Balance Account for Dr. Thomas Wu

<table>
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<tr>
<td>$30,000</td>
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<td>RF - High Linearity RF Power Amplifier Design, Simulation, and Characterization</td>
<td>Jiangxi Xinyu Huatong Machinery Co., Ltd</td>
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<td>ECE Total: $3,292,199.00</td>
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ECE Total Research Funding CY2011 $3,292,199
External $3,116,866 Internal $175,533

- Educational $0
- Corporate $1,157,323
- State $5,000
- Federal $1,954,343
- Internal $175,533
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<tr>
<td>US-TAMUQ - Workshop: Recent Research and Educational Activities in Power Electronics and Drives</td>
<td>Batarseh</td>
<td>NSF</td>
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<td>US-UAE Workshop: Energy Developments, Addressing the need of the energy industry, Abu Dhabi, UAE December 2011</td>
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<td>International Research Experience for Students in Photovoltaic Based Power Electronics Conversion Systems</td>
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<td>21st Century World Class Scholars Program (Van der Weide Endowed Professorship in Laser Medicine)</td>
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<td>Florida Board of Governors</td>
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<tr>
<td>The 21st Century World Class Scholars Program (Simaan Endowed Chair)</td>
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<td>Florida Board of Governors</td>
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<td>Photovoltaic Power Electronics Research Initiative (PERI) for Developing Low Cost, Ultra-compact, Three-phase Micro Inverters or &quot;AC Bricks&quot;</td>
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<td>US Dept of Energy/Golden, Field Office</td>
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<tr>
<td>Image-Based Motion Estimation and Tracking for Collaborative Space Assets</td>
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<td>Florida Space Institute</td>
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<tr>
<td>CRPA: Communicating Avatars: Artificial Intelligence + Computer Graphics = Innovative Science</td>
<td>DeMara</td>
<td>NSF</td>
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<td>IRES: U.S.-France Research and Education on Contextual Reasoning and its Application to Conversational Agents</td>
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<tr>
<td>Supplement to NSF Towards Life-like Computer Interfaces that Learn</td>
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<td>I3: The UCF Community Embraces the Knowledge-Based Economy</td>
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<td>UCF STEP Pathways to STEM: From Promise to Prominence</td>
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<tr>
<td>Young Entrepreneur and Scholar (YES) Scholarship Program</td>
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<td>CAREER: Next-Generation Ultra-Low-Cost Phased Arrays</td>
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<td>Wireless Passive Ceramic MEMS Sensors for High Temperature Applications</td>
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<td>FCAAP Online, In-Situ Monitoring Combustion Turbine Wireless Passive Ceramic Sensors</td>
<td>Jones</td>
<td>US Dept. of Energy</td>
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<td>Volcanic Eruption Forecasting Algorithm (VEFA)</td>
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<td>Florida Space Grant Consortium</td>
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<td>Failure Criteria Metric under ESD Stress Conditions</td>
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<td>Analog Devices</td>
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<td>Grid Stability with Distributed Generations and Varying Topologies - Phase II</td>
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<td>Collaborative Research: Control of Atomic-Scale Friction by Normal Surface Oscillation</td>
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<tr>
<td>EAGER: Game and Teaming Strategies for Networked Systems</td>
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</table>
3.5 Collaborations with Research Centers and Institutes

ECE has active collaborations with centers and institutes on campus. Below is the list of joint ECE appointees and their home unit.

50% ECE and 50% NanoCenter

### Aman Behal
Associate Professor

**College of Optics**

- Peter Delfyett
  Joint Faculty
- Sasan Fathpour
  Joint Faculty
- Martin C. Richardson
  Joint Faculty
- M.J. Soileau
  Joint Faculty

**FSEC**

- Neelkanth Dhere
  Joint Faculty

**External Collaborators**

- Georgios Anagnostopoulos
  Joint Faculty
- Eytan Pollak
  Visiting Research Professor
4. Partnership, Outreach and International Activities

4.1 The Industrial Affiliates Board (IAB)

The 2012 EECS Industrial Advisory Board meeting was held on June 26th, 2012 at Harris Corporation Engineering Center room 101. The meeting was held to collaborate on research areas and enhancing the quality of CpE and EE undergraduate and graduate academic programs.

**Industry Advisor Board Members**

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
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<tbody>
<tr>
<td>Venkataramanan (Ragu) Balakrishnan</td>
<td>Chair of ECE @ Purdue University</td>
</tr>
<tr>
<td>Mike Braden</td>
<td>Orlando Health</td>
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<tr>
<td>Jennifer Burg</td>
<td>Wake Forest University</td>
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<tr>
<td>Ernest Chritton</td>
<td>Boeing</td>
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<tr>
<td>Jason Coleman</td>
<td>Orlando Magic</td>
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<tr>
<td>David Farlow</td>
<td>SAIC</td>
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<td>Robert Franceschini</td>
<td>SAIC</td>
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<td>Herb Gingold</td>
<td>Texas Instruments</td>
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<td>Lou Glaros</td>
<td>Lockheed Martin</td>
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<tr>
<td>Chris Haddad</td>
<td>Gartner Group</td>
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<tr>
<td>John Hart</td>
<td>Army Research Lab</td>
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<tr>
<td>David Jensen</td>
<td>Harris</td>
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<td>W. Joel D. Johnson</td>
<td>Harris</td>
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<tr>
<td>Donna Kocak</td>
<td>Harris</td>
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<tr>
<td>David Lamb</td>
<td>Camgian Microsystems</td>
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<tr>
<td>Trey Lewis</td>
<td>Campus Crusade for Christ, International</td>
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<tr>
<td>Susan Mendez</td>
<td>Progress Energy</td>
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<tr>
<td>Craig Neeb</td>
<td>ISC Motor Sports</td>
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<tr>
<td>Ali Sareea</td>
<td>HD Supply</td>
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<td>Joel Schwalbe</td>
<td>CNL</td>
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<td>Kris Siegmundt</td>
<td>Lockheed Martin</td>
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<tr>
<td>Paul Stewart</td>
<td>Siemens</td>
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<tr>
<td>Glen Taylor</td>
<td>Disney</td>
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</table>
4.2 SENIOR DESIGN DAY

The Senior Design Day was held on April 13th, 2012 in Engineering 2 – Atrium and Harris Engineering Center. Senior Design Day includes both the 4th Annual UCF CECS Senior Design Symposium on Renewable and Sustainable Energy and the college-wide Senior Design Showcase. It was sponsored by Progress Energy; the 4th Annual Symposium presents some of the best energy innovation and socially conscious energy solutions by graduating seniors. The symposium’s keynote speaker was Dr. Dan Arvizu, director, U.S. Department of Energy National Renewable Energy Laboratory. After more than three decades of professional engagement in the clean energy field, Dr. Arvizu has become one of the world's leading experts on renewable energy and sustainable energy. He frequently engages with national leaders in Congress, the Administration, academia, non-governmental organizations, and industry.

During their senior year, UCF engineering and computer science students bridge the gap between academic and professional experience by participating in year-long design and build projects that involve different disciplines of the engineering profession. Along with their faculty advisors, students work to develop innovative and creative product proposals, conduct the design analysis, design and build prototypes, and prepare engineering reports. At the end of their senior year, students present and demonstrate their projects at the college’s Senior Design Day that includes the 4th Annual Senior Design Symposium on Renewable and Sustainable Energy and the college-wide Senior Design Showcase. Senior Design Day is free and open to the campus community, industry, and the public.

4.3 OUTREACH ACTIVITIES

Science Olympiad National Tournament

The 2012 National Tournament of the Science Olympiad was held at the University of Central Florida on May 18-19, 2012. One of the nation’s most prestigious science, technology, engineering and math (STEM) competitions, Science Olympiad brings together 120 winning middle and high school teams who have advanced from their state-level competitions in the spring. The goal of Science Olympiad is to improve the quality of science education through competitions similar to sporting events. Just as students are motivated to compete in various sporting activities, students compete as a team against other schools in 23 different events that range the spectrum of science subjects. They had about 360 volunteers overall. There were 60 high school teams and 60 middle school teams and 1 honorary high school team from Japan. There were many UCF faculty, staff and student volunteers whose involvement contributed to the success of this event. Science Olympiad is devoted to improving the quality of science education, increasing student interest in science and providing recognition for outstanding achievement in science education by both students and teachers.
Camp Connect

The Department of EECS participated in the Camp Connect on July 16th-20th, 2012. Camp Connect is a week-long STEM (Science, Technology, Engineering, & Math) camp on UCF Main campus for 8th through 10th grade students from underrepresented communities. They invited 110 students going into the 8th, 9th, and 10th grades, from under-represented areas. They had 105 students daily for a week. Each day they were exposed to different Engineering & Computer Science fields. They spent a day doing hands on activities, visiting labs and being engaged in Computer Science, Electrical Engineering, Industrial, Civil, Environmental, Transportation, and Mechanical & Aerospace Engineering. Camp Connect showed the students how engineers connect, communicate, and improve the world. It connected students in engineering integrated activities and provides tips on how to prepare for a college degree & network.

4.4 International Activities

NSF International Research Experiences for Students grant: “US/France Collaboration on Context-Based Reasoning”. Project PI Dr. Avelino Gonzalez (EECS-CS Division) who obtained the grant in 2010, organized, and leads the project. Dr. Ron DeMara (EECS-ECE Division) participated in June 2011 as co-PI for 8 days at Universite de Pierre et Marie Curie presenting and interacting with the faculty and researchers on the computational processing of lifelike avatars. The grant hosts a group of UCF faculty and students to exchange ideas and establish a working relationship on the topic of lifelike avatars.

The project has two major objectives:
1) Provide our students with the opportunity to carry out research in their field in an international setting, and
2) Make meaningful advances in the field of contextual reasoning and conversational agents.

From UCF so far, 2 graduate students and 4 undergraduate students have interacted and collaborated with their academic counterparts at Universite de Pierre et Marie Curie to produce new representation and interfacing code for contextual reasoning and conversational agents in both English and French.
5.1 WIE – WOMEN IN ENGINEERING

The Women in EECS (WEECS) is a group of ladies whose mission is to promote fellowship and professional development among female students within the Department of ECES at UCF. They organize activities that promote mentoring and community service and arrange distinguished speaker seminars. The 2011-2012 academic year was eventful for WEECS as they focused on social activities to provide members with bonding opportunities. WEECS held eight socials ranging from pot lucks to gardening events. Twenty one of their members had the opportunity to attend the Grace Hopper Celebration in Portland, OR where they were able to network with and learn from other women in computing. Two members of WEECS participated in a new undergraduate mentoring program called L.E.A.R.N. As freshman, both mentees presented their work at the Showcase of Undergraduate Research; one of which received a special recognition for the quality of his research project.

As usual, WEECS participated in several K-12 and outreach programs such as The Seminole County Science Fair and the 2012 National Tournament of the Science Olympiad. The most exciting outcome of this year was the involvement of the club in founding a community and industry supported out-reach program called Robots R.O.C.K in several public elementary schools. In collaboration with ACM at UCF, the Orlando section of IEEE, as well as students and Faculty at Valencia College, this program will become a monthly staple in two elementary schools in Central Florida during the 2012-2013 school year.

<table>
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<th>Date</th>
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<tr>
<td>Dec 9, 2011</td>
<td>5:15 pm Holiday Party, HEC 356</td>
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<tr>
<td>Oct 5, 2011</td>
<td>11:30 am - 2:00 pm, Bake Sale , HEC Atrium</td>
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<tr>
<td>Sep 29, 2011</td>
<td>9:00 pm, Tilted Kilt Social, Tilted Kilt, University Blvd.</td>
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<tr>
<td>Sep 28, 2011</td>
<td>12:00 pm - 1:00 pm, Financial Wellness Seminar By Fifth Third Bank, HEC 101</td>
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<tr>
<td>Sep 10, 2011</td>
<td>College Open House, HEC Lawn</td>
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