

# Jeremy Sells

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Highly motivated Ph.D. candidate seeking a full time position at a cutting edge company. A proven leader with over 5 years of microfabrication, sensor design and test experience. My problem solving skills combined with my attention to detail make me a valuable asset to any team.

## EDUCATION

### Ph.D. Electrical and Computer Engineering

May 2011

*University of Florida, Gainesville, FL*

GPA: 3.95/4.0

Dissertation "Passive Wireless Shear-Stress Sensor Array"

### M.S. Electrical and Computer Engineering

May 2009

*University of Florida, Gainesville, FL*

GPA: 3.94/4.0

### B.S. Electrical Engineering

May 2005

*University of Maine, Orono, ME*

GPA: 3.83/4.0

Passed the Fundamentals of Engineering Examination

## RESEARCH EXPERIENCE

### NASA GSRP/ARMD Fellow and Research Assistant

Spring 2007-Present

*Interdisciplinary Microsystems Group, University of Florida*

- Research Project "Passive Wireless Shear-Stress Sensor Array" a NASA sponsored research grant worth \$.5M.
- Tested wireless sensors and demonstrated working prototypes, the first of their kind.
- Developed electrical and mechanical models for wireless sensor design and verification studies.
- Designed five process flows from mask layout to die sorting strategies.
- Fabricated prototype coils and two generations of a MEMS sensor in the Nanoscale Research Facility at UF.
- Manufactured custom coils on printed circuit boards for sensor packaging.
- Managed the project as the lead student on the grant.
  - Responsible for group meeting facilitation and preparing annual reports for NASA.
  - Took charge of a team of graduate and undergraduate researchers to achieve the projects goals.

### Aeronautics Scholarship Summer Intern

Summers 2008,2009,2010

*NASA Langley Research Center, VA*

- Worked for the Flow Physics and Control Branch with a group of NASA engineers on sponsored research.
- Shear Flow Control Tunnel Project
  - Instrumented the 20" x 28" Shear Flow Control Tunnel for test section characterization using hotwire anemometry, pitot-static probes, and Preston tubes.
  - Tested a wired MEMS shear stress sensor to obtain both mean and dynamic data from a flat plate boundary layer at multiple flow velocities.
  - Wrote a LabVIEW control program to run the tunnel and take data from an array of tunnel condition monitoring instruments as well as the sensors themselves.
  - Tested wireless sensors developed at UF in the 20" x 28" Shear Flow Control Tunnel.
- Constant Current Anemometer Project
  - Designed a low noise constant current anemometer to enable low noise flow testing.
  - Researched state of the art low noise components needed to realize a working prototype.
  - Segmented the design, ran simulations, built prototypes and tested each subsystem.

**Research Assistant**Fall 2003-Spring 2005*Laboratory for Surface Science and Technology, University of Maine*

- Designed new magnetic transducers and modified sensor material selection to enhance performance.
- Experimented with polylysine and glucose solutions to simulate Biotin-Avidin antibody detection.
- Wrote two technical reports for Maine Technology Initiative Grants, both were funded for a total of \$40k.
- Reported progress at weekly meetings and gave two full technical presentations.
- Won a university wide competition for outstanding undergraduate research.
- Adapted control software of the RAM-5000 system to enable automated testing.

**Research Assistant**Summer 2003*National Science Foundation Research Experience for Undergraduates, University of Maine*

- Designed and tested electromagnetic acoustic transducers.
- Explored techniques for exciting bulk acoustic waves for biological and chemical sensor applications.
- Collaborated with a team of chemists, physicists, biologists, and electrical engineers.
- Wrote a final report and presented successful results at the end of the program.

**Solar Intern**Summer 2000*Solar Living Institute, Hopland, CA*

- Designed and assembled two stand alone solar electric systems.
- Designed a large theoretical system within given parameters.
- Collaborated with a team to troubleshoot problems with the centers primary power systems.

**TEACHING EXPERIENCE****Teaching Assistant**Fall 2002 - Fall 2004*University of Maine*

- Taught the general engineering section of Introduction to Engineering to 60 students.
  - Organized lesson plans, lead design challenges and mentored new engineering students.
- TA for the lab section of both Introduction to Engineering and Microcomputer Engineering.
  - Aided students with laboratory circuit and code diagnostics
  - Helped to redesign lab assignments and projects.

**PUBLICATIONS, PATENTS & GRANTS****Journals**

- Sells J., Chandrasekharan V., Arnold D.P., and Sheplak M., "Development of a Wireless Shear Stress Sensor," Journal of Micromechanics and Microengineering, (In Preparation).
- Chandrasekharan V., Sells J., Meloy, J., Arnold, D.P., and Sheplak, M., "Development of a Microscale Differential Capacitive Direct Wall Shear Stress Sensor," Journal of Microelectromechanical Systems, (In Review).

**Conference Papers (Peer Reviewed)**

- Sells J., Chandrasekharan V., Sheplak M., and Arnold D.P., "Passive Wireless Direct Shear Stress Measurement," Solid-State Sensors, Actuators and Microsystems Workshop (Hilton Head 2010), Hilton Head, SC, June 2010.
- Chandrasekharan V., Sells J., Arnold D.P., and Sheplak M., "Effect of Dynamic Pressure of Direct Shear Stress Sensor Design," AIAA-2010-047, Orlando, FL, January 2010.
- Chandrasekharan V., Sells J., Meloy J., Arnold D.P., and Sheplak M., "A Metal-On-Silicon Differential Capacitive Shear Stress Sensor," Transducers'09, Denver, CO, June 2009.

**Patents**

- Chandrasekharan V., Sells J., Sheplak M., Arnold D. P., "Structure and fabrication of a microscale flow-rate/skin friction sensor," PCT/US2009/37158, 3/13/09.

## Grants

- Chandrasekharan V., Griffin B., Sells J., Cattafesta L., Sheplak M., "MEMS Skin Friction Sensor," NASA SBIR Phase I, 2010.
- Vetelino J., Sells J., French L., "SBIR Phase I Proposal Development for EMAT Sensors," Maine Technology Initiative Seed Grant, 2004. (\$10k Matched)
- Vetelino J., Sells J., French L., "Proof of Concept for Integrated EMAT Sensors," Maine Technology Initiative Seed Grant, 2004. (\$10k Matched)

## HONORS & AWARDS

- |                              |              |   |              |
|------------------------------|--------------|---|--------------|
| • NASA GSRP Fellowship       | 2007- 2010   | • IEEE Professional Society                 | 2003-Present |
| • NASA ARMD Scholarship      | 2007-2009    | • Golden Key Honor Society (Sec. 03-04)     | 2003-Present |
| • Francis Crowe Society      | 2005-Present | • Senior Skull Society (Sec. 04-05)         | 2004-Present |
| • Tau Beta Pi (V.P. 04-05)   | 2003-Present | • Outstanding Undergraduate Research Winner | Spring 2004  |
| • Eta Kappa Nu (Tres. 04-05) | 2003-Present | • Butler and Walter W. Turner Scholarship   | 2003-2004    |

## COURSE WORK

Principals and Design of MEMS I & II, Microfabrication Technology, Sensors I & II, Applied Magnetics, Electromagnetic Theory I & II, Microwave Engineering, Photonics, FEA in Electromagnetics, RF Circuits, Data Measurement and Analysis, Scanning Electron Microscopy

## SKILLS

- Software** MATLAB, LabVIEW, COMSOL, AutoCAD, Mathcad, FastHenry, Micro-Cap(spice), Ultiboard, ExpressPCB, CircuitCAM, Basic, C++, SYSTAT, Max-plus, Maxwell SV, MS Office, MathType, EndNote
- Hardware** Network Analyzer, Impedance Analyzer, Material Analyzer, Cascade Probe Station, Spectrum Analyzer, Pressure Meters, Traverse, PXI DAQ, Function Generators, Oscilloscopes, Multimeters, Power Supplies, Ritec RAM-5000
- Fabrication** MA6 Aligner, Suss Spin Coater, EVG Wafer Bonder, STS DRIE, Unaxis RIE, Anatec Asher, STS PECVD, KJL Sputter, Evaporator, Electroplating, JST Wet Bench, General Acid Bench, Ovens and Hotplates, Dektak Profilometer, JEOL SEM, ADT Dicing Saw, K&S Wirebonder, PCB Milling, CNC, Oxford J355ps Laser

## REFERENCES

### David P. Arnold, Ph.D.

Associate Professor  
Department of Electrical and Computer Eng.  
University of Florida  
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### Dr. George B. Beeler

Research Scientist  
Flow Physics and Control Branch  
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### Dr. Mark Sheplak

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### Catherine B. McGinley

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