

# James 'Trip' Humphries

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CONTACT INFORMATION      *E-mail:* James.Humphries@knights.ucf.edu  
*Web:* triphumphries.info

CLEARANCE      DoD Secret (NACLC) - July 2008

EDUCATION      **University of Central Florida**, Orlando, FL USA  
Ph.D., Electrical Engineering, (Expected: May 2016)

- Dissertation Topic: "Passive, Wireless Surface Acoustic Wave Strain Sensor & Software Radio Interrogator"
- NASA Graduate Student Researchers Program (GSRP) Fellow

**University of Central Florida**, Orlando, FL USA  
M.S., Electrical Engineering, December, 2012 (GPA: 3.9)  
B.S., Electrical Engineering, December, 2010 (GPA: 3.6)

- Honors in the Major (Undergraduate Thesis): "A Novel Approach for Extending Delay Time in Surface Acoustic Wave Devices"

EXPERIENCE      **University of Central Florida**, Orlando, FL USA  
*Graduate Research Assistant (GRA)*      **January 2011 - Present**

- Designed passive, wireless surface acoustic wave (SAW) sensors (Temperature & Strain)
- Developed software defined radio interrogator (passive sensor RADAR) for wireless SAW sensors based on the universal software radio peripheral (USRP)
- Fabricated SAW devices using contact photolithography with sub-micron ( $0.9\mu m$ ) resolution in Class 100/1000 cleanrooms
- Software extraction of SAW sensor information using MATLAB and Python
- Characterized and tested SAW devices and RF/microwave components using network analyzers, spectrum analyzers, and custom software

*Graduate Teaching Assistant (GTA)*

- Assisted with teaching and laboratory responsibilities of various courses
- Fabrication of Solid State Devices (EEE 5356) - Lab Instructor - Fall 2013
- Semiconductors (EEE 3350) - Grader - Spring 2011, Fall 2012

*Undergraduate Research Assistant*      **January 2010 - December 2010**

- Designed, fabricated, and tested a reflective multistrip coupler (RMSC) to increase delay time in SAW devices
- Assisted with various research projects to develop wireless SAW sensor technology

**RS&H**, Merritt Island, FL, USA  
*Electrical Engineering Intern*      **August 2008 - December 2009**

- Supported design process for space launch facilities and industrial buildings
- Developed CAD drawings with AutoCAD and ProE
- Carried out cost estimates, design calculations (power, voltage drop, lighting, etc.), and performed construction support

EXPERIENCE  
(CONTINUED)

**Simulation and Training Technology Center, Orlando, FL, USA**

*Engineering Intern*

**May 2008 - August 2008**

- Engineering support for the development of simulation aids for the U.S. Army
- Tested and demoed simulator software as well as provided technical support for simulator hardware and software

**Carl Black Buick Pontiac GMC, Orlando, FL, USA**

*E-Commerce Support*

**June 2007 - October 2007**

- Developed search engine optimization (SEO) techniques to increase dealership online presence
- Create and monitor Google Adwords campaigns as well as perform minor website modifications

**eLEAD CRM, Orlando, FL, USA**

*Technical Support Representative*

**May 2005 - August 2006**

- Provided technical support for customer relationship management (CRM) software designed to optimize lead tracking and sales at car dealerships
- Responsible for phone and e-mail technical support, software debugging, and data mining

PUBLICATIONS

**Humphries, J.R.;** Gallagher, M.W.; Gallagher, D.R.; Weeks, A.R.; Malocha, D.C., "Interrogation of Orthogonal Frequency Coded SAW Sensors Using the USRP," Frequency Control Symposium & the European Frequency and Time Forum (FCS), 2015 Joint Conference of the IEEE International , pp.530,535, 12-16 April 2015

**Humphries, J.R.;** Malocha, D.C., "Wireless SAW Strain Sensor Using Orthogonal Frequency Coding," Sensors Journal, IEEE, 11 June 2015

**Humphries, J.R.;** Gallagher, M.W.; Malocha, D.C., "Analysis of Inter-Sensor Interference for Wireless SAW Sensors," Ultrasonics Symposium (IUS), 2014 IEEE International, pp.396,399, 3-6 Sept. 2014

**Humphries, J.R.;** Malocha, D.C., "Software Defined Radio for Passive Sensor Interrogation," European Frequency and Time Forum & International Frequency Control Symposium (EFTF/IFC), 2013 Joint, pp.270,273, 21-25 July 2013

Malocha, D.C.; Gallagher, M.; Fisher, B.; **Humphries, J.;** Gallagher, D.; Kozlovski, N. "A Passive Wireless Multi-Sensor SAW Technology Device and System Perspectives," Sensors 2013, 13, 5897-5922.

**Humphries, J.R.;** Malocha, D. C., "Passive, Wireless SAW OFC Strain Sensor," Frequency Control Symposium (FCS), 2012 IEEE International, pp.1-6, 21-24 May 2012

CONFERENCE  
LECTURES

**IEEE IUS 2014 - Chicago, IL, USA - "Analysis of Inter-Sensor Interference for Wireless SAW Sensors"**

Presented theory and simulation of wireless SAW sensor interference caused by other SAW sensors present in the system

**IEEE IFCS 2012 - Baltimore, MD, USA - "Passive, Wireless SAW OFC Strain Sensor"**

Presented theory, fabrication, and test results of a passive, wireless strain sensor based on SAW technology and orthogonal frequency coding (OFC)

SKILLS	<ul style="list-style-type: none"> <li>• <b>Engineering and Modeling:</b> Matlab, MathCAD, Xilinx ISE, MultiSIM, HFSS, ADS, AutoCAD, COMSOL</li> <li>• <b>Programming Languages:</b> Python (SciPy, GNU Radio), Verilog, C, HTML, Git DVCS</li> <li>• <b>Applications:</b> MS Office, L<sup>A</sup>T<sub>E</sub>X, MathType, Inkscape, Sketchup, Windows, Linux</li> <li>• <b>RF Test Equipment:</b> Vector Network Analyzer (VNA), Spectrum Analyzer, Oscilloscope, RF Probe Station</li> <li>• <b>Cleanroom and Fabrication:</b> Electromask Pattern Generator, Karl Suss Mask Aligner, E-Beam Metal Deposition, Wafer Dicing Saw, Gold Wire Bonder</li> <li>• <b>Ettus USRP:</b> B200, N200, X300</li> <li>• <b>Licenses:</b> FAA Sport Pilot</li> </ul>
HONORS AND AWARDS	<ul style="list-style-type: none"> <li>• NASA GSRP Fellowship (\$30k/yr), 2011 - 2014</li> <li>• IEEE IFCS Student Paper Competition Finalist, 2012</li> <li>• MegaWatt Ventures Business Plan Competition Finalist (\$10k), 2011</li> <li>• IEEE Microwave Theory and Techniques Society Undergraduate Scholarship (\$1.5k), 2010</li> <li>• UCF Honors in the Major Scholarship (\$1k), 2010</li> <li>• UCF Director's Special Achievement Scholarship (\$2.4k), 2006</li> <li>• Florida Bright Futures Scholarship, 2006-2010</li> </ul>
MEMBERSHIPS AND EXTRACURRICULAR	<ul style="list-style-type: none"> <li>• IEEE &amp; Ultrasonics, Ferroelectrics, and Frequency Control Society, 2008-Present</li> <li>• Aircraft Owner's and Pilots Association (AOPA), 2012-Present</li> <li>• UCF Robotics Club, 2009-2010</li> <li>• UCF Project Daedalus Sub-Orbital Sounding Rocket, Electrical Team, 2009</li> <li>• Students for the Exploration and Development of Space (SEDS), 2009-2010</li> <li>• Space Florida Undergraduate Workshop, 2008</li> </ul>
RELEVANT COURSEWORK	<ul style="list-style-type: none"> <li>• Fabrication of Solid State Devices</li> <li>• Surface Acoustic Wave Devices</li> <li>• Microwave Engineering</li> <li>• RF and Microwave Communications</li> <li>• Biomedical Sensors</li> <li>• Optoelectronics</li> <li>• Semiconductor Lasers</li> <li>• Introduction to RADAR</li> </ul>