James 'Trip' Humphries

CONTACT INFORMATION

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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 (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 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) **Various Semesters**

- 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
- Various responsibilities including phone and e-mail technical support, software debugging, and data mining

Publications

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

- **Engineering and Modeling:** Matlab, MathCAD, MultiSIM, HFSS, ADS, AutoCAD, Xilinx, COMSOL
- **Programming Languages:** Python (SciPy, GNU Radio), Verilog, C, HTML, Git DVCS
- **Applications:** MS Office, LaTeX, MathType, Inkscape, Sketchup, Windows, Linux
- **RF Test Equipment:** Vector Network Analyzer (VNA), Spectrum Analyzer, RF Probe Station
- **Cleanroom and Fabrication:** Electromask Pattern Generator, Karl Suss Mask Aligner, E-Beam Metal Deposition, Wafer Dicing Saw, Gold Wire Bonder
- **Ettus USRP:** B200, N200, X300
- **Licenses:** FAA Sport Pilot

Honors and Awards

- NASA GSRP Fellowship ($30k/yr), 2011 - 2014
- IEEE IFCS Student Paper Competition Finalist, 2012
- MegaWatt Ventures Business Plan Competition Finalist ($10k), 2011
- IEEE Microwave Theory and Techniques Society Undergraduate Scholarship ($1.5k), 2010
- UCF Honors in the Major Scholarship ($1k), 2010
- UCF Director's Special Achievement Scholarship ($2.4k), 2006
- Florida Bright Futures Scholarship, 2006-2010

Memberships and Extracurricular

- IEEE & Ultrasonics, Ferroelectrics, and Frequency Control Society, 2008-Present
- Aircraft Owner's and Pilots Association (AOPA), 2012-Present
- UCF Robotics Club, 2009-2010
- UCF Project Daedalus Sub-Orbital Sounding Rocket, Electrical Team, 2009
- Students for the Exploration and Development of Space (SEDS), 2009-2010
- Space Florida Undergraduate Workshop, 2008

Relevant Coursework

- Fabrication of Solid State Devices
- Surface Acoustic Wave Devices
- Microwave Engineering
- RF and Microwave Communications
- Biomedical Sensors
- Optoelectronics
- Semiconductor Lasers
- Introduction to RADAR