

# Evan Pezent

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*Updated: 12/1/2016*

## EDUCATION

**MS/PhD, Mechanical Engineering** August 2015 – Present  
Rice University, Houston, TX GPA: 3.83

**BS, Mechanical Engineering** August 2010 – December 2014  
The University of Alabama, Tuscaloosa, AL GPA: 3.98

## RESEARCH EXPERIENCE

### **Mechatronics and Haptic Interfaces Lab – Graduate Researcher, Houston, TX**

Advisor: Dr. Marcia K. O'Malley

*August 2015 – Present*

- Leading the design of a robotic wrist exoskeleton for stroke rehabilitation. Improvements over existing devices include: increased range of motion and torque, decreased inertia and friction, improved ingress/egress, electrical cable routing through joint axes, polymer-ceramic coating for passive motion capture and EMG compatibility, etc.
- Integrating hand and wrist robotic exoskeletons for full hand-wrist rehabilitation in collaborative project with UT-Austin ReNeu Lab.
- Investigating the kinematic and dynamic effects of wearable wrist exoskeletons while performing single and multi-DOF motions through use of passive marker motion capture

### **Jordon Research Group – Undergraduate Researcher, Tuscaloosa, AL**

Advisor: Dr. Brian J. Jordon

*August 2014 – December 2014*

- Research assistant on portable airfield matting project with US Army Engineering Research and Development Center (ERDC).
- Developed finite element model of currently existing matting to study joint connector geometry and effects of varying aircraft loads.
- Independently designed and modeled original lightweight prototype matting to improve upon existing matting by incorporating friction stir welding techniques and a novel connector geometry.

### **Precision Manufacturing Research Facility – Undergraduate Researcher, Tuscaloosa, AL**

Advisor: Dr. Kevin Chou

*August 2013 – August 2014*

- Research assistant on electron beam additive manufacturing (3D printing) project with NASA's Marshall Space Flight Center. Developed and deployed a suite of MATLAB algorithms to process thermal video of printing process of titanium and Inconel alloys. Analyzed multiple data including beam speeds, temperature profiles, molten pool characteristics, emissivity, etc.
- Research assistant on diamond coated cutting tool project with National Institute of Standards and Technologies (NIST). Primary research was in analyzing temperature profiles, force data, and specific cutting energies of a lathe process and studying the effects of tool radius, cutting depth, and cutting speed.

## **PUBLICATIONS/ PRESENTATIONS**

Agarwal, P., Blumenshein, L., Esmaltoo, P., Fox, J., Losey, D., Madden, K., **Pezent, E.**, Rose, G., Yun, Y. (2016, November). *Design and Development of a Cybernetic Rehabilitative Hand-Wrist Exoskeleton*. Poster session presented at the Annual NSF Cyberphysical Systems PI Meeting, Washington D.C.

Agarwal, P., Fox, J., Losey, D., Madden, K., Pehlivan, A., **Pezent, E.**, Rose, Sergi, F., G., Yun, Y. (2015, November). *Design and Development of a Cybernetic Rehabilitative Hand-Wrist Exoskeleton*. Poster session presented at the Annual NSF Cyberphysical Systems PI Meeting, Washington D.C.

## **INDUSTRY EXPERIENCE**

### **BASF – Engineering Intern, Hydroxylamine, Freeport, TX**

*January 2015 – August 2015*

- Lead Criticality Assessment team to rank criticality of 3,000+ plant equipment and instrumentation items based on contribution margin, plant capacity reduction, repair time/costs, etc. Developed tools, methodology, and protocol for ranking criticality; organized and lead assessment meetings with key personnel; validated assessment rankings.
- Member of Fire, Explosion, Release (FER) team. Identified and corrected potential hazards within plant.
- Aided in audit preparation by developing robust equipment databases.

### **Phifer Incorporated – Student Engineer, Tuscaloosa, AL**

*March 2013 – August 2014*

- Designed, oversaw fabrication in plant machine shop, and implemented over 40 projects of varying complexity including: modular stop motion and material cutting devices, load-cell installations and monitoring, chemical piping and metering systems, pneumatics and automation, heavy loading and material handling equipment, etc.
- Played a major role in the reestablishment of operations following a plant fire by designing new rinse/wash vats and suspended walkways as well as installing a large-scale industrial vacuum system.
- Evaluated the benefit of installing a rinse water recycling system. Collaborated with Guardian IPCO of Birmingham, AL in finding the most appropriate and cost-effective solution.
- Established scope of work, issued purchase orders, and oversaw execution of work by suppliers and contractors involved with projects.
- Day-to-day maintenance, repair, and upgrade of existing plant equipment.

### **Hargrove EPC – Engineering Intern, Mobile, AL**

*June 2011 – August 2011*

- Worked in the Process Engineering department revising PID/PFDs and schematics for a project with Chevron.
- Developed robust spreadsheet-based applications to aid engineers in calculating temperature drops in transfer piping.

*June 2010 – August 2010*

- Fabricated and assembled analyzer/instrumentation cabinets for Southern Company.
- Organized bid packages and drawings for various projects.

**SELECTED  
INVENTIONS/  
PROJECTS**

The following is a list of original inventions designed and developed during career. Detailed drawings and images available upon request.

- RiceWrist-S 2.0, 3-DOF Powered Wrist Exoskeleton (Rice)
- Lightweight Expeditionary Airfield Matting (Jordon Research Lab/UA)
- Mechanical Spool Lifter/Forklift Attachment for Half-ton Spools (Phifer Inc.)
- Transportable Surface Tension Material Winder (Phifer Inc.)
- Modular Yarn Stop Motion/Detector for Weaving Looms (Phifer Inc.)
- Automated Slag Removal System for Electric Arc Furnaces (Nucor Steel/UA)

**RELEVANT  
SKILLS**

**Programming:** MATLAB/Simulink, C++, C#, Python

**Software:** SolidWorks, AutoCAD, Inventor, Abaqus FEA, LS-DYNA, HyperMesh, Office, Keyshot, Adobe Creative Suite (Photoshop, Illustrator, Premier Pro)

**Fabrication:** Manual Lathe, Manual Milling Machine, CNC (Mastercam), 3D Printers (MakerBot, Stratasys), Laser Cutters

**HONORS/  
ACTIVITIES**

IGERT: Neuroengineering from Cells to Systems Fellowship – Rice University, Spring 2017  
Sue H. and Harold R. Galloway Graduate Fellowship Fund – Rice University, Fall 2015  
University of Alabama President’s List (Spring 2011, Fall 2012, Spring/Fall 2013, Spring 2014)  
University of Alabama Dean’s List (Fall 2010, Fall 2011, Spring 2012)  
2<sup>nd</sup> Place Overall Senior Design Project – University of Alabama, Spring 2014  
Carl Albright Jr. Scholarship Recipient, Fall 2012 – Spring 2013  
Collegiate Scholarship Recipient, Fall 2010 – Spring 2014  
Dean’s Engineering Excellence Scholarship Recipient, Fall 2010 – Spring 2014  
Tau Beta Pi Engineering Honor Society, inducted Fall 2012  
Phi Eta Sigma Honor Society, inducted Fall 2010  
American Society of Mechanical Engineering, Fall 2010 – Present