Ryan - David Reyes

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Education

Case Western Reserve University — **Cleveland, OH**
M.S. Biomedical Engineering — *Fall 2016–Spring 2021*

Florida State University — **Tallahassee, FL**
B.S. Computer Engineering and B.S. Electrical Engineering with Honors, GPA: 3.83 — *Fall 2011–Spring 2015*

Experience

Graduate Student, Research Assistant

Case Western Reserve University — **Cleveland, OH**
Biomedical Engineering Department, Advanced Platform Technology Center — *August 2016–May 2021*

- **Masters Project**: Biologically Inspired Optimal Terminal Iterative Learning Control for a Motorized Hybrid Neuroprosthesis
  - a device for persons with paraplegia which combines functional electrical stimulation (FES) of their muscles with a motorized exoskeleton to restore their ability to walk using learning algorithms.
  - Designed and implemented the firmware of the exoskeleton in C across multiple Teensy 3.6's communicating over CAN.
  - Developed a web-based real-time user interface for the exoskeleton with Javascript, Node.js and Socket.IO with a Raspberry Pi.
  - Development of algorithms to control stimulated muscles and motors in tandem using terminal iterative learning control.
  - Publication: Effect of Joint Friction Compensation on a "Muscle First" Motor-Assisted Hybrid Neuroprosthesis
  - Publications as co-author:
    - Embedded control system for stimulation-driven exoskeleton
    - Biologically Inspired Optimal Terminal Iterative Learning Control: A Modeling Study
    - Adaptation Strategies for Personalized Gait Neuroprosthetics
- Worked with a mechanical engineer to create an origami-inspired folding quadcopter for the class *EMAE 488: Advanced Robotics*.
- Non-degree related:
  - Created an open source linear algebra library for the Elm programming language: elm-numeric.
  - Contributed to Blender, the open source 3D modeling software. The patch concerned rewriting OpenGL 2 dependent API with an OpenGL 3 shader-based library.

Biomedical Engineering IT Support

Case Western Reserve University, Louis Stokes VA — **Cleveland, OH**
Biomedical Engineering Department, Advanced Platform Technology Center — *Nov 2017–Dec 2019*

- General technical support for Researchers ranging from email administration to solving computer hardware issues.
- Management of MATLAB License Servers
- Management of Remote Linux (Rocks Distribution) Computing Clusters

Research Assistant

Florida State University — **Tallahassee, FL**
Mechanical Engineering Department, CISCOR Robotics Lab — *July 2012–August 2014*

- Created drivers for Inertial Measurement Units, Gamepads, TCP/IP, and Force Sensors on Windows, Linux, and QNX in C++.
- Implemented Real-Time Linux Xenomai Framework on robots with comprehensive documentation.
- Experience writing control systems with QNX Real-Time operating system (RTOS).
- Project: GOLIATH - Gas Operated Land Intelligent All Terrain veHicle - Autonomous ATV designed for terrain classification.
  - Designed the control system that allows the user to drive the ATV via a Logitech Gamepad, communicating with the host system via TCP/IP for Windows, Linux, and QNX in C++.
- **Honors Thesis**: Identification of the Inertial Parameters of Manipulator Payloads
  - Concerned what motions a load bearing two-link manipulator can use to identify the inertial parameters of its payload.
  - Used to augment CISCOR Intelligent Planner - Sampling Based Model Predictive Optimization (SBMPO) Research.

Qualifications and Awards

Outstanding Master's Work Award in the CWRU Biomedical Engineering Department: *Spring 2021*

Recipient of NIH T32 Training Grant: *Fall 2016*

NSF Graduate Research Fellowship Program (GRFP) Honorable Mention: *Spring 2015*

Eagle Scout - Boy Scouts of America: *Dec. 2009*