Fernando A. Pascual

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Skills

- **Programming Languages:** Proficiency in Java; Knowledge of Python, Ruby, C, HTML, CSS, JavaScript, Assembly
- **Technologies and Frameworks:** Ruby on Rails, React.js, Jquery, Bootstrap, Object-Oriented Programming, Embedded Systems, Heroku Cloud Web Services, UNIX/Linux Environment (MacOS, Ubuntu), Git, SQL Databases (MySQL, PostgreSQL)
- **Languages:** Native Fluency in English and Spanish, Intermediate Portuguese, Basic Japanese

Projects

Subbit (www.subbit.net) October 2019 – Present

- Leveraged RESTful API and MVC structure with Ruby on Rails to create user generated pages of events occurring near subway stops
- Created versioned APIs of backend data to allow state management with React.js frontend
- Collected data from Metropolitan Transportation Authority to create PostgreSQL database of subway stops
- Manipulated database relationships between users and their comments and posts
- Applied object oriented design paradigms to handle instances of database models
- Utilized Bootstrap CSS to create aesthetic frontend UX/UI and create minimal confusion for users
- Incorporated Google Maps JavaScript API to display subway stop locations and provide navigation for users

PID Feedback Control of DC Motor December 2018

- Applied C language to manipulate speed of a DC motor under PID feedback control with microcomputer
- Programmed functions to alert user of operational sensor readings and errors displayed on LEDs
- Controlled output of digital PWM signal to create a trapezoidal velocity profile for smooth motor acceleration and deceleration
- Measured analog velocity and compared to setpoint in code to modulate velocity profile to maintain desired motor speed

Assembly On/Off Control of Solenoid November 2018

- Employed assembly code to manipulate current output of two transistors feeding a solenoid
- Learned about bit manipulation to control digital logic on an embedded system
- Program management of four modes of operation while refactoring code to increase readability and reusability

Thermodynamic Optimization of Condenser March 2018

- Optimized heat transfer for a condenser in Python using CoolProp thermodynamic data library
- Applied iterative functions to maximize performance of the condenser based on limiting factors such as Reynolds number
- Maintained initial input values as variables to allow reusability of code for other condensers and input values

Professional Experience

NORESCO, United Technologies Corporation **New York, New York**

Engineer 1 October 2019 – Present

- Developed strong relationship with clients through communication of project needs and troubleshoot solutions for energy savings
- Selected to perform survey on HVAC system at the Library of Congress to determine areas for energy improvements

Final Frontier Design Space Suit Research and Development **Brooklyn, New York**

Engineering Intern June – August 2018

- Redesigned EVA spacesuit wrist bearings to decrease manufacturing costs 10% and reduce the number of components
- Researched and synthesized crucial technical data for SBIR contract for development of Life Support System sublimator plates

Polymer Exploration Group, LLC – National Science Foundation **Ashland, Virginia**

Engineering Intern June – August 2016 & 2017

- Designed and constructed roll-to-roll manufacturing oven that increased product production by 1200%
- **Publication** - Wei Zhang, W.*, Brinn, C., Cook, A., **Pascual-Marquez, F.** (2017) "*Ice-Release and Erosion Resistant Materials for Wind Turbines.*" Journal of Physics: Conf. Series.

NASA Langley Research Center **Langley, Virginia**

Summer Residential Governor's School Mentee July – August 2014

- Debugged tensile testing machine for research and test of mechanical properties of experimental polymers to classify their elastic properties

Leadership and Activities

Cooling Lead and Systems Integration, Formula SAE EV Fall 2018 – Spring 2019

- Design, test and CNC programming of motor and inverter mount, sprocket, and sprocket holder
- Utilized Solidworks FEA to iterate on designs and validate design choices for safety and ease of manufacture

Buchla 100 Series Synthesizer Restoration Project, Columbia Prof. Vallancourt Fall 2017 – Spring 2019

- Analyzed circuitry to determine solutions to defunct modules and electronic components while maintaining historical integrity

Education

Columbia University School of Engineering and Applied Science

Bachelor of Science in Mechanical Engineering, Completed May 2019, GPA: 3.1

Relevant Coursework: Data Structures and algorithms in Java; Mechatronics and Embedded Microcomputer Control; Python Computer Science Fundamentals; Intro to Electrical Engineering; Intro to Human Spaceflight; Thermodynamics and Heat Transfer; Mechanics of Fluids; Statics; Dynamics; Vibrations; Control Systems; Mechanical Engineering Lab