Fernando A. Pascual

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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

Skills

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

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 product development of Life Support System sublimator plates
- Performed finite element analysis to redesign Pressure Relief Valve hardware under rapid decompression conditions to improve flow while maintaining cost and weight.
- Conducted flow simulations to determine pressure drop within Liquid Cooling Garment

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

Projects

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

- Leveraged RESTful API/MVC architecture with Ruby on Rails to create user generated pages of events occurring near subway stops
- Created API of backend data with version control to allow state management with React.js frontend

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 system design 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

Leadership and Activities

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

- Developed time management for the product development process of Columbia's first FSAE electric vehicle
- Integration of electrical systems into existing chassis for Columbia's first FSAE Electric Vehicle
- 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

President/Treasurer/Player, Columbia University Men's Lacrosse Club — Spring 2017 – Spring 2019

- Employed excellent communication that quadrupled membership dues collection, team commitment, and management of budget