

Brandon Joel Gonzalez – Curriculum Vitae

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Career Objectives

Interested in the development and innovation of electronics engineering and related fields. Beginning a doctorate in electrical engineering, starting in Fall 2021, with a long-term goal of working in teaching and research at a university. Love of learning, teaching, and helping guide others to their fullest potential.

Education

Carnegie Mellon University – College of Engineering

- ❖ Ph.D Student in **Electrical and Computer Engineering** – Entering Fall 2021
 - Research Advisor: Dr. L. R. Carley
 - Research Interests: electronics design; embedded systems; mechatronics

University of Pennsylvania – School of Engineering and Applied Science (SEAS)

- ❖ M.S.E. in **Robotics** – Spring 2021 – GPA: 3.46/4.00
 - Master's Thesis: "Exploring the Development of Novel Sensor Systems for Human Occupancy Detection"
 - Advisors: Dr. Camillo Jose Taylor of [GRASP](#) and Dr. Madhu Annapragada of [Automation Research Group](#)
 - Began in June 2020 and presented in May 2021
- ❖ B.S.E. in **Computer Science**, minor in **Mathematics** – Fall 2019 – GPA: 3.54/4.00 – **Cum Laude**
 - Senior Project: [TeaBot](#)
 - Advisor: Dr. Camillo Jose Taylor
 - Began in August 2018 and presented in May 2019

Teaching Experience

UPenn SEAS – CIS/ESE Teaching Assistant

- ❖ TA for the Department of Computer and Information Science (CIS) & Department of Electrical and Systems Engineering (ESE)
- ❖ Responsibilities include: lecturing, recitations, lab and review sessions, lab and office hours, explanation videos, forum monitoring, staff meetings, grading, project advising, development of course labs, projects, and curricula
- ❖ Semesters as head TA denoted with * and semesters online denoted with ^
- ❖ TA history:
 - CIS240/CIT593: **Introduction to Computer Systems** – Fall 2018, Spring 2019, Summer 2019^
 - Introductory systems course covering topics from CMOS logic gates to architecture design to operating systems programming
 - CIS380/548/CIT595: **Operating Systems** – Fall 2019, Spring 2020*, Summer 2020*^
 - Advanced course exploring design and implementation of operating systems, primarily Unix-based, in the C programming language
 - CIS371/501: **Computer Architecture** – Fall 2019, Spring 2020^
 - Advanced course exploring design and optimization techniques in modern computer architecture, with labs in Verilog

- ESE190/M&TSI: **Introduction to Hardware/Software Lab** – Spring 2019, Summer 2021*[^]
 - Introductory laboratory course exploring the Arduino platform, primarily for students without engineering background
- ESE350/519: **Embedded Systems Lab** – Fall 2020[^], Spring 2021*[^]
 - Advanced laboratory course covering the foundations and design of embedded systems platforms, across both hardware and software levels
- ESE450/451: **ESE Senior Design** – Fall 2019, Spring 2020[^], Fall 2020*[^], Spring 2021*[^]
 - Two-part senior capstone project series for students in the Electrical and Systems Engineering department and related majors

Research Experience

Pennovation – Embedded Systems Researcher – Occupancy Detection Device

- ❖ Goals:
 - Designing a hybrid sensor device for occupancy detection
 - Collecting in-lab occupancy test data to identify which combinations of sensors most accurately count occupants while conserving power consumption
 - Aiming to enhance automatic lighting control as a possible application
- ❖ Tools:
 - C for interfacing with sensors via an ATmega328p microcontroller
 - MATLAB for data acquisition and algorithm development
 - Hybrid sensor system incorporating:
 - PIR sensor for simple motion detection
 - Thermopile array for basic person detection via infrared imaging
 - mm-wave sensor for higher-fidelity person tracking
 - Camera-based computer vision compared against hybrid sensor system as baseline
- ❖ Work guided by [Automation Research Group](#) and [Instahub of Pennovation](#)
- ❖ Began in June 2020 and ended in May 2021

Skills and Coursework

Languages: Native in English, fluent/heritage in Spanish, elementary in French

Key Courses Taken: Operating Systems, Computer Architecture, Embedded Systems, Mechatronic Systems, Autonomous Robotics, Signal Processing, Control Systems, Digital/Analog/RF Electronics

Technologies Learned/Utilized:

- ❖ Software
 - Programming languages such as C, C++, Python, MATLAB
 - Hardware description languages such as Verilog
 - Programming environment tools such as Simulink, ROS
 - Operating systems tools such as Unix shells
- ❖ Hardware
 - Microcontrollers such as ATmega328P, ESP32
 - Circuit simulation tools such as SPICE, Ngspice
 - PCB design tools such as Altium, EAGLE
 - Various electrical components and devices such as resistors, capacitors, inductors, diodes, AC and DC currents, MOSFETs, BJTs, op-amps, transducers, sensors, servomotors, DC motors, batteries, power supplies, voltage regulators, etc.

Activities and Interests

- ❖ SEAS Orientation Peer Adviser for Class of 2022 (CIS) and Class of 2023 (CMPE)
- ❖ SEAS Mentor for First-Year Robotics Graduate Students in Spring 2021
- ❖ Head of Hardware team for PennApps hackathon from Spring 2019 to Spring 2021, organized with Major League Hacking (MLH)
- ❖ Member of the organizing committee for the 2019 CIS Diversity Summit

Awards and Recognitions

- ❖ Recipient of the 2017 Penn Undergraduate Research Mentoring (PURM) Grant
- ❖ Recipient of the 2018 Penn Engineering Exceptional Service Award
- ❖ Recipient of the 2019 Littlejohn Scholars Summer Research Grant
- ❖ 2019-20 J.P. Eckert Fellow
- ❖ 2020 inductee of the CIS TA Hall of Fame
- ❖ Recipient of the Summer 2020 TA Award for Excellence in Student Support with Distinction
- ❖ 2021 ESE Diversity, Equity, and Inclusion Fellow
- ❖ Honorable Mention for the 2021 Penn Engineering Outstanding Teaching Award
- ❖ 2021-22 Carnegie Institute of Technology Dean's Fellow

References available upon request.