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

❖ Candidate for Ph.D in *Electrical and Computer Engineering* — Entering Fall 2021
  ➢ Research Interests: analog, digital, and power electronics; micro/nano-electronics; integrated circuit design; embedded and mechatronic systems; signal processing

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

❖ M.S.E. in *Robotics* — Spring 2021 — GPA: 3.39/4.00
  ➢ Master's Thesis: "Exploring Development of Novel Sensor Systems for Occupancy Detection", which aims to design a hybrid single-chip solution by combining optimal sensor technologies
    ■ Primary advisor: Dr. Camillo Jose Taylor of <u>GRASP</u>
    ■ Secondary advisor: Dr. Madhu Annapragada of <u>Automation Research Group</u>
    ■ Work done in collaboration with <u>InstaHub</u>
    ■ Began in June 2020 and expected to complete in May 2021

❖ B.S.E. in *Computer Science*, minor in *Mathematics* — Fall 2019 — GPA: 3.54/4.00 — *Cum Laude*
  ➢ Senior Project: <u>TeaBot</u>, a mechatronic robot arm that uses computer vision to harvest tea leaves
    ■ Advisor: Dr. Camillo Jose Taylor
    ■ Began in August 2018 and completed 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 C
  ➢ CIS371/501: *Computer Architecture* — Fall 2019, Spring 2020^

- Advanced course exploring design and optimization techniques in modern computer architecture
- ESE190/M&TSI: ***Introduction to Hardware/Software Lab*** — Spring 2019, Summer 2020^, Summer 2021*^
  - Introductory laboratory course exploring the Arduino platform, primarily to 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 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

CMU — ECE PhD Researcher — Electronics Research Group
- Based at CMU in Dr. L. Carley's laboratory group
- Beginning in September 2021

Pennovation — Electronics Design 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
- Based in Pennovation, working with Automation Research Group and Instahub
- Using MATLAB for data acquisition + algorithm development, and PIR + thermopile array + mm-wave sensors compared against camera-based vision as a baseline
- 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, Computer Graphics, Signal Processing, Control Systems, Digital Circuits, Laboratory Electronics, Embedded Systems, Mechatronic Systems, Autonomous Robotics
Technologies Learned/Utilized:
- Software
  - Programming languages such as C, C++, Python, MATLAB
  - Hardware description languages such as Verilog
  - Programming environment tools such as ROS, Simulink
  - 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 such as resistors, capacitors, inductors, diodes, 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)

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
- ❖ Honorable Mention for the 2021 Penn Engineering Outstanding Teaching Award
- ❖ 2021 ESE Diversity, Equity, and Inclusion Fellow
- ❖ 2021-22 Carnegie Institute of Technology Dean's Fellow

References available upon request.