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: analog/RF electronics; micro/nano-electronics; integrated circuits; signal processing

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 <u>GRASP</u> and Dr. Madhu Annapragada of <u>Automation Research Group</u>
    - ■ Began in June 2020 and completed 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>
    - ■ 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 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 <u>Automation Research Group</u> and <u>Instahub</u> of <u>Pennovation</u>
❖ 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 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)

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
- ❖ 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.