Tony Antoine Abdo

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Education

University of California, Berkeley

M.S. - Mechanical Engineering | Concentration in Controls — May 2017

B.S. - Mechanical Engineering |Minor in Electrical Engineering and Computer Science — May 2016

Relevant Coursework: Feedback Controls, Model Predictive Control, Mechanical Behavior of Engineering Materials, Artificial Intelligence, Machine Learning, Robotics, Embedded Systems, Vehicle Dynamics, Signals and Systems

Relevant Experience

Co-Founder – Leaf Suit Inc. (Wearable Air Conditioner) Jun 2018 – Jan 2021

- Designed and programmed via ICSP a 1" x 2" PCB controlling 6 fans, 2 diaphragm pumps, and smart button
- Designed and made pattern to allow comfort for wearer while still achieving conformity and cooling coverage
- Worked with professional grant writers to define targets and put together grant submissions for NHS and military

Mechatronics Engineer – Tesla Apr 2018 – Dec 2019

- Conceptualized, designed, and brought up manufacturing of a plastic part in over 50,000 Model S/X vehicles
- Designed and built machines for operators to use in seats manufacturing, increasing production by 30%
- Developed a controller utilizing CAN protocol to command seat motions when isolated from the car

Robotics Mentor (FRC/Berkeley PiE) Sp. 2014, Jan.– Mar 2018, Feb 2021 – Present

- Mentored 20 high school students in the PiE robotics competition, receiving Outstanding Mentor Award
- Co-Founded non-profit organization, Friends of Falkon Robotics, to fund High School Robotics team
- Teach students how to design and build a robot while taking into account real physical principles

Hardware Engineer – Dash Robotics Internship Jun 2016 – Aug 2016

- Self-taught C to prototype, design, and implement the firmware infrastructure needed to support future accessories on the Kamigami robot's existing i2c communication bus to boost future sales
- Designed and manufactured tools to aid in improving the assembly line yield from 70% to 90%

Product Engineer – Texas Instruments Internship Jun 2015 – Aug 2015

- Built a test jig, designed in SolidWorks and optimized for cost, to isolate inductive and capacitive sensors
- Automated the test jig above for motion and data collection using LabVIEW and TestStand

Technical Skills

- 3D Modeling: Inventor, CATIA, SolidWorks FEA, SolidWorks certified
- Programming: MATLAB (proficient), Python (proficient), C++ (proficient)
- Other: Altium PCB design, machining on lathe and mill, 3D printing, soldering, i2c, SPI, CAN

Projects

tonyabdo.com/portfolio

Line Following Car

- Designed and manufactured circuit boards for BLDC motor control and power regulation
- Wrote the firmware for reading sensor data within the interrupt-driven control loop for accurate and tight timing
- Incorporated embedded feedback controls with gain scheduling for steering and velocity control

Drone Controller

- Implemented various control and state estimation techniques determined from MATLAB simulations

Automatic Parking with Obstacle Avoidance

- Created a MATLAB simulation based on a dynamic-programming algorithm found in a research paper

Gesture Controlled Quadcopter

- Built a fully functional drone with modified off-the-shelf components
- Used Python to map input hand gestures and IMU feedback data to command roll, pitch, and yaw angles

Adaptive Cruise Control (ACC)

- Designed the electrical system for two cars to drive autonomously with off-the-shelf components
- Implemented the embedded controls for both the lead and follow cars, as well as the data collection infrastructure

Modular Robotic Arm

- Collaborated to design and build a modular-arm system where each unit is a 1-DOF joint
- Wrote the control logic within each joint to follow positional commands given by the central processor