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Hayato S. Kato

Electrical/Control Engineer

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Education

University of California, Los Angeles (UCLA) – Henry Samueli School of Engineering ***September 2017 – Present***
- M.S. in Electrical and Computer Engineering – *Control Systems and Optimization Track* *Expected Diploma December 2022*
- B.S. in Electrical Engineering (Cum Laude) *June 11, 2021*

Skills

Embedded Systems	Arduino, Raspberry Pi, STM32 Microcontrollers, Pozyx platform (UWB positioning)
Programming Language	C++, Python, MATLAB, Shell, Java, BASIC
Libraries	ROS, openFrameworks(opensource C++ toolkit), p5.js (opensource JavaScript graphical library)
Engineering Software	Simulink, Simscape Multibody, MATLAB App Designer, Autodesk Fusion 360, Autodesk EAGLE, SPICE, Git, GrabCAD, STM32CubeIDE, Arm® Mbed, Webots
Manufacturing	Through-Hole and Surface-Mount Soldering, FDM and SLA 3D Printing, Laser Cutting, CNC Machining
Language	Fluent English, Fluent Japanese

Organizations and Awards

UCLA Eta Kappa Nu(HKN) – *Iota Gamma Chapter* ***Fall 2020 – Present***
Dean's Honors List ***Spring 2018, Winter 2019, Fall 2019, Winter 2020, Spring 2020, Spring 2021***

Technical Experience

Garama RC Car Platform Research Project - *Robotics and Mechanisms Laboratory (RoMeLa)* ***Summer 2022 - Present***
- Worked under a PhD student to help design and aid with testing of a new 1/28th scale RC racing car platform developed to outperform a world champion class driver by utilizing behavior cloning and flow prediction to compensate for oversteering

Makerspace Staff - *UCLA Boelter Innovation Lab* ***Fall 2021 - Present***
- Worked approximately 10 hours per week maintaining the Makerspace and helping other engineering students use the available manufacturing tools such as 3D printers and laser cutters for their capstone, course, or personal projects

SCALER Research Project - *Robotics and Mechanisms Laboratory (RoMeLa)* ***Summer 2021 - Present***
- Worked under Prof. Dennis Hong and several PhD students to develop SCALER (Spine Enhanced Climbing Autonomous Legged Exploration Robot), mainly fixing reliability issues with the hardware electronics and developing software for controlling the under-actuated whippletree mechanism spine gripper.
  - Redesigned both the hardware and firmware for an automated test bed used to collect data on the gripper performance.
  - Wrote a MATLAB script that computes the FK of the SCALER model from actuator angles and visualizes it in a 3D figure.
  - Designed and assembled a standalone gripper package that uses a library to sends position commands and retrieves the current actuator state from the onboard STM32 Nucleo board

NIRS Research Project - *Interconnected & Integrated Bioelectronics Lab (I^2BL)* ***Spring 2020 - Spring 2021***
- Worked for Prof. Sam Emaminejad to develop a near IR spectroscopy system for lower leg tissue oxygenation monitoring

Optoprobe Research Project - *Dunn Lab* ***Fall 2019 - Winter 2022***
- Worked with Prof. Bruce Dunn in the MSE department to develop a Bluetooth enabled optoprobe device that is hooked up to a living mouse to send a two-channel optical stimulation to different parts of its brain via optical fibers

Extracurricular Projects

AAMC Micromouse Robot – *Institute of Electrical and Electronics Engineers (IEEE)* ***October 2018 - March 2020***
- Designed and manufactured an autonomous maze solving robot that competed in the 2019 All American Micromouse Competition (AAMC) at UCLA, earning 5th place out of 13 other participating teams coming from other universities in the region
  - Printed a custom PCB designed in Autodesk EAGLE that had a board dimension of 90mm x 90mm and hand-soldered the board containing over 250 SMD components, including a STM32 microcontroller with 48 pins
  - Utilized a Floodfill algorithm to solve the 16x16 maze, phototransistor signal processing to sense the maze walls, and motor encoders to allow for precise motion of the mouse using PID control (coded in C++)

BotW Guardian Hexapod Robot – *American Society of Mechanical Engineers (ASME) X1 Robotics* ***October 2018 - September 2021***
- Led the Electrical and Targeting subsystems, where I oversaw a team of around 3 6 undergraduates from various majors
  - Assigned specific research tasks and relayed information from the leads meeting, but also designed the overall robot's system architecture alongside other subsystem leads and selected electrical components used in the project
- Created a robot inspired by an enemy called the "Guardian" from the Legend of Zelda: Breadth of the Wild video game that relied on a Raspberry Pi master-slave architecture to modularize each of the subsystems (coded in Python)
  - Responsible for developing the inverse kinematics model program to dynamically calculate servo angles for the hexapod's walking gate, allowing omni-directional mobility regardless of the orientation of the hexapod
  - Developed a reliable 2DOF laser targeting system in the robot's head that utilized the Agile Eye parallel mechanism that was actuated using a pair of closed-loop stepper motors