Shiv Seetharaman

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EDUCATION

HARVEY MUDD COLLEGE
BS in General Engineering
Expected May 2019 | Claremont, CA
Eng. GPA: 3.6 / 4.0
Dean's List: Fall 2016, Fall 2017, Spring 2018

COURSEWORK
• Microprocessor Systems and Applications
• Data Structures
• System Identification, Estimation, and Learning
• Autonomous Navigation
• Control Theory and Signal Processing
• Digital Design and Computer Architecture
• Electrical and Magnetic Circuits
• Experimental Engineering (underwater robots)
• Continuum Mechanics

SKILLS

PROGRAMMING
Proficient:
C • C++ • MATLAB • Python • ARM Assembly
Knowledgeable:
Linux • OpenCV • gRPC • Protocol Buffers • iOS dev/Swift

ENGINEERING
Proficient:
PCB Design (KiCAD) • System Verilog • I2C, SPI, UART • Microcontrollers, FPGAs • Oscilloscopes, Logic Analyzers • Board Bring-up • SPICE • Lathe/ Mill Machining
Knowledgeable:
Kalman and Particle Filters • Motion Planning • Localization • Time Series and Random Processes • Fiber Optics • Networking • Telecommunications

ACTIVITIES

TEACHING ASSISTANT
Microprocessor Systems (Head TA, F-18) • Digital Electronics and Computer Architecture (Head TA, S-18) • Experimental Engineering - Underwater Robots (S-18) • Intro to Signals and Systems (F-17)

EXPERIENCE

TECHMATION - Firmware Engineer (Clinic Program, Team of 5)
Sept 2018 – Present | Claremont, CA
- Programming the embedded software and data-processing pipeline for a millimeter wave radar sensor to detect and track obstacles, in real-time.

X, THE MOONSHOT FACTORY (GOOGLE X) - Software Engineering Intern: Free Space Optical Communications (FSOC)
May 2018 – Sept 2018 | Mountain View, CA
- Built and tested an atmospheric channel emulator to characterize FSOC modem performance. Caught critical bugs to assist modem development and validate algorithms. Presented findings to senior engineers and executives.
- Tested an ASIC for a novel modulation scheme to be used in future systems.
- Programmed the data-processing pipeline for a system statistics/performance visualizer to improve and expedite characterization, development, and monitoring. Used Go, gRPC, and Protobufs.

WET (DESIGN) - Hardware Engineer (Clinic Program, Team of 6)
Jan 2018 – May 2018 | Harvey Mudd College, Claremont, CA
- Worked on a team to design and build 8 autonomous, wireless floating robots to swim in a synchronized pattern with bright, flashing lights.
- Helped design a Bluetooth PCB with the nRF52 BLE chip for multilink UART.
- Designed, assembled and tested a closed-loop current driver PCB for high-power LEDs. Implemented thermal and current management features.
- Programmed, tuned and tested a PID controller in Python for the floating robots to autonomously follow a desired trajectory.

OPEN DEVICES ENGINEERING LAB - Student Researcher
Jun 2017 – Sept 2017 | Harvey Mudd College, Claremont, CA
- Wrote embedded C, and designed, assembled and tested a PCB to generate sine waves between 10 kHz and 20 MHz to build a low-cost network analyzer prototype. Used a direct digital synthesis (DDS) chip interfacing with an STM32 microcontroller over SPI.
- Explored time interleaving to increase sampling rate without additional costs.

PROJECTS

VISION BASED PATH PLANNING AND LOCALIZATION - Team of 2
April 2018 – May 2018 | Claremont, CA
Wrote Python to implement a Particle Filter to localize a wheeled robot using encoders and an overhead camera. Used a motion planner to drive the robot from a start to goal state while avoiding dynamic obstacles. (Website: bit.ly/2Orxaaj)

LED MATRIX CONNECT-4 GAME - Team of 2
Oct 2017 – Dec 2017 | Claremont, CA
Wrote System Verilog on an FPGA to implement a custom LED Matrix driver using an NRZ protocol running at 800 kHz and a frame buffer using a dual-port RAM. Wrote embedded C on a Raspberry Pi for the game interface and an LCD display driver. (Report: bit.ly/2P8KL6S)

AUTONOMOUS WEATHER BOAT - Team of 4
Mar 2017 – May 2017 | Claremont, CA
Used a Hall effect sensor to make a wind speed sensor, sampled using interrupts in C. Programmed a proportional control GPS way-point tracking system for autonomous navigation. Designed OP-AMP circuits for sensor signal conditioning.