

Shaun Liu

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EDUCATION

Carnegie Mellon University – School of Computer Science

Pittsburgh, PA

Master of Science in Robotic Systems Development | GPA: 4.08/4.33

May 2021

Coursework: Computer Vision, Machine Learning, Localization & Mapping, Autonomy, Deep RL, Manipulation, Estimation & Control

University of California, Los Angeles

Los Angeles, CA

Double Major: Bachelor of Science in Mechanical Engineering and Bachelor of Arts in Economics

Jun 2014

PROJECTS

Autonomous Driving for Adverse Road Conditions

CMU | Sep 2019 - Dec 2020

- Deployed real-time semantic segmentation network to differentiate between drivable and adverse terrain, optimized inference speed with multithreading, and achieved mean IoU of 95%
- Trained instance segmentation network to track patches of wet asphalt with custom dataset
- Localized robot using custom encoders, IMU, and GPS with an extended Kalman Filter and achieved centimeter-level accuracy
- Designed architecture for an autonomous system that perceives road conditions and adjusts vehicle controls accordingly
- Built vehicle enclosure to house sensors and designed PCB to power and control components on a 1/5th scale vehicle
- Integrated perception, localization, controls, planning, and interface subsystems on an NVIDIA Jetson Xavier

Robot Referee with Computer Vision

CMU | Oct 2020 - Dec 2020

- Developed an automatic line judge for tennis using a ZED stereo camera
- Implemented court line detection, ball tracking, contact detection, plane estimation, and perspective transformation

Franka Robot Jenga Resetting

CMU | Jan 2020 - May 2020

- Controlled Franka robotic arm using forward and inverse kinematics and planned trajectories with RRT and collision detection
- Programmed reinforcement learning pipeline for Jenga resetting with RL Bench

WORK EXPERIENCE

Motional (Hyundai-Aptiv Joint Venture)

Pittsburgh, PA

Intern

May 2020 - Aug 2020

- Planned and analyzed autonomous vehicle logical scenarios with synchronized robots and sensors
- Established Hardware-in-the-Loop Simulation to validate requirements of the autonomous vehicle stack
- Accelerated the validation process by automating test case generation and execution

CleNET/Truetel

Taipei, Taiwan

Test Automation Engineer

Jan 2019 - Apr 2019

- Designed automated test processes from scratch for an intelligent driver safety system that helps drivers prevent collision
- Developed Python scripts to analyze system behavior and control robotic arms, microphones, LEDs, and sensors

Amada Miyachi America

Los Angeles, CA

Field Engineer

Nov 2014 - May 2017

- Implemented manufacturing solutions for over 100 companies across 10 countries, including leaders in automotive, aerospace, electronic components, and medical industries
- Programmed vision tracking and inspection, motion controls, and rapid firing for laser welding, marking, and cutting
- Integrated automated systems into factories, started new production lines, and resolved emergency line down situations
- Tested prototypes, established application processes, and devised QA tests for customized systems
- Optimized manufacturing processes to increase production rate, improve quality, and reduce production cost

SKILLS

- **Programming Languages:** C++, Python, MATLAB
- **Frameworks/Libraries:** ROS, PyTorch, TensorFlow, OpenCV
- **Other:** Raspberry Pi, Arduino, SolidWorks, Linux, Git, Jira