Ashar Alam

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EDUCATION

STANFORD UNIVERSITY
MS in Mechanical Engineering
March 2020 | Stanford, CA

KAIST
BS in Mechanical Engineering
August 2018 | Daejeon, South Korea
College of Engineering
Magna Cum Laude

GIIS QUEENSTOWN
Grad. May 2014 | Queenstown, Singapore

COURSEWORK

GRADUATE
• Smart Product Design (ME218)
• Principles of Robotic Autonomy
• Vehicle Dynamics and Controls
• Introduction to Robotics
• Computer Organizations and Systems (CS107) • Programming Abstractions in C++ (CS106B)* • Introduction to Linear Dynamical Systems (EE263)* • Control Design Techniques • Decision Making Under Uncertainty*

**(Courses to be done in Fall' 2019)*

UNDERGRADUATE
• Modelling and Control of Engineering Systems • Mechatronics • Applied Electronics

SKILLS

PROGRAMMING
• C • C++ • Python • HTML/CSS
• ROS • MATLAB/Simulink • Docker
• Assembly • Unix Tools and Scripting
• CARLA • Unreal Engine • Blender

ELECTRICAL
• CAD - Altium Designer
• Equipment - Oscilloscope, Saleae Logic Analyzer, DMM, Function Generator, Soldering

MECHANICAL
• CAD - SOLIDWORKS, AutoCAD
• CAE - ANSYS, OpenFOAM
• Manufacturing/Prototyping - Conventional Workshop machines, Laser cutting, FDM/SLA 3D Printing, Clean Room, Photolithography

PROFESSIONAL AND TECHNICAL EXPERIENCE

LUCID MOTORS | Autonomous Driving Software Intern
Jun 2019 - Sep 2019 | Newark, CA

- Tested control algorithms on multiple driving simulation platforms using C++ and Python for validating controller design for ADAS and AD scenarios
- Developed middleware interface between simulation softwares and controller architecture
- Customized simulation software environment for validating and testing vehicle dynamics and autonomous driving control algorithms
- Implemented controller architectures for Autonomous Driving on Highways

SMART PRODUCT DESIGN | Mechatronics - ME218
Sep 2018 - Jun 2019 | Stanford University | Prof. Ed Carryer

- Built intelligent electro-mechanical systems and embedded hardware and software with experience in:
  - Efficient event-driven software design using state machines
  - Use of SPI, I2C and UART for inter-process communication
  - Circuit design for range detectors, photodiodes/photoresistors, accelerometers, motor drivers, voltage regulators, DC, Stepper Servo motors
  - Use of equipment such as oscilloscopes, logic analyzers, DMMs etc.
- Built an arcade game, an autonomous ball collecting robot and a remote controlled hovercraft (using XBee for RC communication) with event-driven code in C on a TI (ARM 32-bit) microcontroller and assembly code on a PIC

AUTONOMOUS DRIVING - SIMULATION & EXPERIMENT | ME227
Apr 2019 - Jun 2019 | Stanford University | Prof. Chris Gerdes

- Generated a velocity and acceleration profile, and calculated lateral forces based on vehicle modelling to traverse an oval path in a given time
- Designed and calculated gains for a Lookahead controller and LQR controller with feedback to adhere to generated profiles
- Simulated controller performances in MATLAB and implemented the aforementioned controllers on a Golf GTI which drove itself autonomously around its designated oval path in a parking lot

AUTONOMOUS DRIVING WITH A TURTLEBOT | AA274
Jan 2019 - Mar 2019 | Stanford University | Prof. Marco Pavone

- Developed a ROS package for a TurtleBot3 Burger to autonomously explore a mock environment where it needed to "pick up and deliver" food items
- Used a costmap overlay and a modified Djikstra algorithm over a map generated by EKF-SLAM package to find the closest unexplored part of the map
- Implemented algorithms in Python to develop the autonomy stack including modules for perception, localization, motion planning and controls

RESEARCH EXPERIENCE

FLOW CONTROL LAB | Undergraduate Researcher
Jun 2017 - Dec 2017 | KAIST, South Korea

- Worked with **Dr. Ghulam Destgeer** and **Prof Hyung Jin Sung** to characterize Microchannel Anechoic Corner, a region within a microfluidic channel in which Surface Acoustic Waves fail to excite microparticles[1]

[1] G. Destgeer, A. Alam, H. Ahmed, J. Park, J. H. Jung, K. Park, and H. J. Sung. Characterization of microchannel anechoic corners formed by surface acoustic waves. *Applied Physics Letters*, *Volume 112*, *Issue 8*, February 2018.