

Dhimant Khuttan

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<https://scholar.google.com/citations?hl=en&user=WJaEFzYAAAAJ>

EDUCATION:

University of Michigan – Dearborn

Bachelor of Science in Robotics Engineering

Department of Electrical and Computer Engineering

Experiential Honors Program

Intelligent Systems Club, Formula SAE, Student Activities Board

Certification Course on Machine Learning from Stanford University

Dearborn, MI

Graduated: April 2022

April 2020 – June 2020

RESEARCH PUBLICATIONS:

- “Protecting Voice-Controlled Devices against LASER Injection Attacks”, *IEEE Workshop on Information Forensics and Security (WIFS)*, Dec 2023 – Accepted and will present at the conference Germany 2023
- “Physical Fingerprinting of Ultrasonic Sensor and Applications to Sensor Security”, *IEEE International Conference, Dependability in Sensor, Cloud, and Big Data Systems and Applications*, Dec 2020, Fiji 2020
- “A Survey on State-of-the-Art Autonomous Vehicle Architecture, V2X Wireless Communication Networks, and Future Directions with 5G Evolution”, *SAE International Journal of Connected and Automated Vehicles 2022* - under review
- “A Survey on State-of-the-Art Internet of Vehicles Security Techniques”, *IJEER*, 2021– Accepted
- “Liability for the Damage Caused by Autonomous Vehicles”, *IJCSN*, 2021 – Under review

PROFESSIONAL EXPERIENCE:

Magna Electronics

Systems and Systems Test Engineer

Auburn Hills, MI

June 2022 – Present

- Contribute in development of self-driving Advanced Driver Assistance Systems (ADAS) features for an Electric Car
- Assist in building CANoe configuration for the ADAS ECU, Front Camera Module ECU, and Radars
- Make sure that all the ECUs satisfy the systems requirements
- Performed of vehicle level test cases for 300+ hours
- Leading a team of 5 engineers on onsite customer location for 4 months
- Assisted and supported in the launch of first Fisker Ocean in USA
- Debugged and resolved ADAS related issues on customer cars
- Calibrated cameras and radars on 100+ vehicles
- Perform features testing and made sure everything is working properly before delivering the cars to the customers
- Visited the first 10 VIP customers and demonstrated the working of the autonomous features of the cars
- Work with the Software, Features, and Application teams to obtain even better results with the autonomous features
- Assisted building Autonomous Parking features for Rivian-Amazon trucks
- Performed system level in-vehicle testing on the Ultrasonic Sensors
- Work with the software team to configure the sensors in order to get optimal results
- Collect lab data and in-vehicle data for analysis
- Configure the radar modules to obtain the desired results
- Create functional safety requirements for front facing camera, radar, and other ADAS modules
- Check and verify if the ADAS modules are working in correspondence with the ISO 26262 standard
- Reviewed safety requirements for the ADAS domain

Magna Electronics

Intern – Cybersecurity and Functional Safety

Auburn Hills, MI

May 2021- Aug 2021, Jan 2022 - Apr 2022

- Worked with Vultara software to understand the threat models in a system of components in a car for Fisker
- Worked towards understanding the working of the ADAS modules including front camera, surround view camera, and radar in accordance with the ISO 26262 standard
- Learned the basics of cryptography and how different types of cryptography protect the data and communication
- Learned how private keys and public keys are used to secure the ECU-module communication
- Documented the lessons learned from past Toyota project to ensure all the steps are clear and followed correctly

National Science Foundation (NSF-REU) - [NSF Award Link](#)

Research Experience for Undergraduates

Dearborn, MI

May 2020 - Present

- Constructed setup that includes 3 components (audio amplifier, laser current driver, and laser diode), modulating signals into a laser beam that fires into smart devices’ microphones
- Audio injected laser attacks on Google Home Mini & Alexa–Echo Dot which were cross checked using oscilloscope
- Build the Google AIY Voice Hat using raspberry pi and collected the data for wavelet decomposition

- Used an SVM classifier to learn the underlying model to differentiate different kind of signals

University of Michigan – CECS Staff

Research Assistant

Dearborn, MI
May 2019 - Present

- Executed physical fingerprinting of ultrasonic sensors of a Ford Fusion using Gaussian Naïve Bayes Classification
- Collected data from the sensors in a controlled environment and perform tests using Machine Learning
- Developed a unique algorithm to protect the data from any foreign attack which checks the authenticity of the signal

RELATED PROJECTS:

FPV Racing Drone

Summer 2020

- In order to lift heavy weight of the drone, made use of 4 brushless motors of 2750 KV each which gave high torque
- Attached a GoPro Hero 8 Action Camera on the quadcopter to record the video while flying
- Connected ESC, flight controller, video transmitter, and split camera to the carbon fibre frame
- Transmitted the signal from the quadcopter to the FPV Goggles to display the live view from the drone
- Programmed the controller to control the quadcopter as per the needs of the pilot

Mars Rover

Winter 2019

- Designed and built an Arduino-based Mars Rover prototype for an engineering course which was selected for Maker Faire Detroit 2019
- Used motor driver IC's to run the motors and programmed Arduino to control them
- Designed and 3D-printed the wheels to manoeuvre through different surfaces properly

TECHNICAL AND PROFESSIONAL SKILLS:

- Proficient in MATLAB, Simulink, C, C++, Arduino, Machine Learning models, AutoCAD, and Microsoft Office
- Worked with Raspberry Pi, CAN, Python, Google AIY Voice Hat, Assemble Language, Visual Studios, and ISO 26262