

ANKIT GOILA

321 Randolph St, Northville, MI, USA

+1(734)747-0829 – agoila@umich.edu – [ankit.goila](https://www.linkedin.com/in/ankitgoila) (Skype)



EDUCATION

University of Michigan, Ann Arbor, MI, USA *Sep'12 - Apr'14*
M.S. Mechanical Engineering *GPA 3.73/4.00*
Automatic Control, Linear Systems Theory, Embedded Control Systems, Mechatronic Systems Design, Vehicle Control Systems, Modeling, Analysis and Control of Hybrid Electric Vehicle.

Delhi College of Engineering, University of Delhi, Delhi, India *Aug'08 - Jun'12*
B.E. Mechanical Engineering (First Class with Distinction) *GPA 3.9/4.00*
Kinematics and Dynamics of Machines, Mechanics of Solids, Thermal Engineering, Fracture Mechanics, Numerical Analysis and Computer Programming.

Udacity Online, Independent Coursework *Jan'17 - Present*
Self-Driving Car Nanodegree, Deep Learning Nanodegree, Artificial Intelligence Nanodegree, Machine Learning Engineer Nanodegree, Introduction to Computer Vision, Artificial Intelligence for Robotics, Introduction to Machine Learning.

Coursera Online, Independent Coursework *Mar'16 - Present*
Machine Learning (Stanford University), Neural Networks for Machine Learning, Learn to Program with Python.

WORK EXPERIENCE

AVL Powertrain Engineering Inc., Plymouth, MI *Nov'15 - Present*
Project Engineer I - Controls

- Part of team working on Driveline Control Module software development for a leading OEM in the automotive industry.
- Responsibilities include writing/compiling software for AWD controls (in C), managing versions with IBM Clearcase, performing detailed software reviews and generating Polyspace bug finder summary reports for on-time production software release.
- Involved with development of Lane line detection algorithm and path planning using LiDAR for self-driving RC car R&D project. Contributions include setup and maintenance of core software architecture using Raspberry Pi, camera and Arduino DUE. Configured OpenCV with OpenMP to utilize multi-processing with Pi. Migrated hardware setup to NVIDIA Jetson TK1 for Deep Learning research.

TRW Automotive, Farmington Hills, MI *Jun'14 - Nov'15*
Algorithm Engineer

- Responsibilities included designing and developing Vehicle Crash Severity Sensing and Vehicle Side Impact Sensing algorithms by using MATLAB/Simulink.
- Performed algorithm applications by simulating algorithms and generating algorithm calibrations for specific vehicle platforms using custom simulation/calibration software with customer provided crash data set.

SELECTED INDEPENDENT PROJECTS (AVAILABLE ON [GITHUB](https://github.com))

Traffic Sign Classification with TensorFlow, Udacity - Self-Driving Nanodegree *Jul'17*

- Built and trained a deep neural network to classify traffic signs, using TensorFlow. Experimented with different network architectures, performed image pre-processing and validation to guard against overfitting.
- Used TensorBoard to visualize the model and created summaries for effective performance analysis.

Creating an AI agent to solve Sudoku, Udacity - Artificial Intelligence Nanodegree *Jul'17*

- Created an AI to solve Diagonal Sudokus using constraint propagation and search techniques. Additionally, taught the agent to use the Naked Twins advanced Sudoku strategy.

Finding Lane Lines on the Road, Udacity - Self-Driving Nanodegree *May'17*

- Used Python, OpenCV tools to create a pipeline to identify lane lines on the road in an image as well as a video stream. Researched and implemented advanced techniques such as HSV colorspace and histogram equalization.

TV Script generation using RNNs, Udacity - Deep Learning Nanodegree *Mar'17*

- Trained a Recurrent Neural Network using TensorFlow on scripts from 'The Simpsons' to generate new script.

CIFAR-10 Image Classification using TensorFlow, Udacity - Deep Learning Nanodegree *Feb'17*

- Built a convolutional neural network from scratch with TensorFlow to classify CIFAR-10 images.

RESEARCH EXPERIENCE

Precision Systems Design Laboratory, University of Michigan, Ann Arbor, MI

Graduate Student Research Assistant

Jan'14 - Apr'14

- Investigated the limits of dynamic performance of solenoid-actuated fuel injectors for GDI engines.
- Conducted patent studies of existing design formulations and utilized the understanding to generate several electromagnetic actuator design concepts.
- Evaluated and optimized the designs for maximal dynamic performance and injector performance via finite elements analysis using ANSYS Maxwell.

Robotics and Motion Laboratory, University of Michigan, Ann Arbor, MI

Graduate Student Research Assistant

Sep'12 - Dec'13

- Designed and manufactured a jointless parallel manipulator with distributed compliance (SpiderBOT) using UG NX-8.0, 3D printing and water jet metal cutting operations.
- Developed and implemented an inverse dynamics control algorithm along with a simulation environment for testing and analysis of the robot using MATLAB/Simulink.
- Established real-time robot control through an EtherCAT framework using MAXON EPOS3 positioning controllers and MAXON EC 60 flat brushless motors with MATLAB's xPC Target functionality.
- Tested hard real-time control capability of Linux (Ubuntu 12.04 LTS) with RT-Preempt and Xenomai real-time kernels, EtherCAT Master 1.5 kernel module and EtherLab with the control setup above.

BAJA SAE Series, Delhi College of Engineering, Delhi, India

Undergrad Research Project

Oct'08 - Dec'11

- Participated in Baja SAE events in India and South Africa. Involved with the design, analysis, manufacturing and assembling of an All Terrain Vehicle subject to the SAE competition guidelines.
- Responsible for the design and manufacture of a two-step chain sprocket gear reduction system operating in tandem with a CVT as the vehicle powertrain. Conducted rigorous design studies while developing unique and innovative solutions for the powertrain system adhering to the competition rulebook.

ACADEMIC PROJECTS

Predictive Powertrain control of a Power-Split HEV, University of Michigan, Ann Arbor, MI

Course Project - ME 566

Jan'14 - Apr'14

- Using MATLAB and SIMULINK, developed and implemented a terrain-based predictive energy management strategy to control a Power-Split HEV.
- Performed minimum-energy-use-benchmarking via Dynamic Programming and compared the results with a conventional rule-based control.

Adaptive Cruise Control, University of Michigan, Ann Arbor, MI

Course Project - EECS 461

Jan'13 - Apr'13

- Designed and implemented a Simulink based bicycle model of a vehicle implementing Adaptive Cruise Control and a PID-based automatic steering control on Freescale MPC 5553 microprocessor unit using MATLAB autocode generation and FlexCAN.

SKILLS

Programming & Simulation: Python, C, CMake, MATLAB/Simulink, L^AT_EX. AWS (aws-cli), Kaggle (kaggle-cli).

Python and Deep Learning libraries: NumPy, Scikit-Learn, Matplotlib, Pandas, TensorFlow, Keras, PyTorch, OpenCV.

Applications & Operating Systems: Adobe Photoshop, Microsoft Office; Windows, Linux, Mac OS X

Version Control: Git, IBM ClearCase, Serena Version Manager, Atlassian JIRA.

Languages: Hindi (*mother tongue*), English (*full professional proficiency*), French (*elementary proficiency*)

SELECTED PUBLICATIONS

Design and Development of Single Seat, Four Wheeled All-Terrain Vehicle for Baja Collegiate Design Series

Paper #: 2015-01-2863 (*SAE 2015 Commercial Vehicle Engineering Congress*)

A Lane Departure Estimating Algorithm Based on Camera Vision, Inertial Navigation Sensor and GPS Data

Paper #: 2017-01-0102 (*WCX 17: SAE World Congress Experience*)

Obstacle Avoidance Strategy and Implementation for Unmanned Ground Vehicle Using LIDAR

Paper #: 2017-01-0118 (*WCX 17: SAE World Congress Experience, SAE International Journal of Commercial Vehicles*)

LEADERSHIP SKILLS AND OTHER ACTIVITIES

Non-exhaustive and in alphabetical order: Exploring VR, Photography, Playing Cricket, Volunteer (Humane Society of Huron Valley), Volunteer (Meals On Wheels); Capacity for independent and self-motivated work, teamwork and co-ordination, ability to locate and assimilate new information rapidly.