

PRANALI KAJALE

📍 Ann Arbor, MI | 📞 (734) 596-8159 | ✉ pranalik@umich.edu | 🔗 [LinkedIn](#)

EDUCATION

Master of Engineering in Automotive Engineering, University of Michigan - Ann Arbor Dec 2023
Coursework: Vehicle Dynamics, Control Systems, Embedded Controls and Digital Controls **GPA: 3.937**

Bachelor of Engineering in Mechanical Engineering, University of Pune, India May 2021
Coursework: Mechatronics, Numerical Methods and Optimization and Theory of Machines **GPA: 3.7**

EXPERIENCE

Magna Electronics Inc. Auburn Hills, MI
Software Algorithm Intern - ADAS May 2023 - Dec 2023

- Developed software interface and architecture for algorithm design of various high-speed comfort ADAS features and implemented it on MATLAB Simulink and C++ platform.
- Defined and implemented a strategy to identify divided high-speed roads using Front Camera Module (FCM) inputs for activation of Lane Change Assist (LCA) feature to satisfy Euro NCAP regulations.
- Performed system identification and PID tuning for steering torque based on steering angle command.
- Validated ASIL-B units of ADAS features, aligning with ISO 26262 standards through unit testing.
- Root-caused and fixed over 50 defects of Auto High Beam assist, Traffic sign and light recognition features using Vector CANoe and Simulink software.
- Tested and tuned control algorithms across MiL, SiL, HiL, and Vehicle System environments using platforms like IPG CarMaker, Vector CAN tools, dSpace and Lauterbach debugger tools.

RELEVANT PROJECTS

Adaptive Cruise Control Winter 2023

- Designed an ACC with distance & speed control and integrated a haptic steering simulation interface.
- Implemented an automatic steering using a PID controller to keep the simulated vehicle on the centerline of the road in MATLAB Simulink. Auto-code Generation to NXP microcontroller.
- Established CAN vehicle communication to simulate different scenarios designed on MATLAB Roadrunner.

Autonomous Racing Vehicle Winter 2023

- Automated a rear-wheel-drive front-wheel-steer bicycle model based Formula One car in MATLAB.
- Developed a race line tracking feedback controller that calculates the corrective steering angle at each moment by analyzing the deviation between the vehicle's position and the race line.
- Created a velocity controller factoring in driving and lateral forces constraints to achieve an optimized lap time of 171.75 seconds specific to the 'Circuit of America' track.

Active Control of a Vehicle Anti-Roll Bar Fall 2022

- Developed a PID controller with a roll moment rejection loop for an active anti-roll bar in the vehicle.
- Derived a 14 DOF full vehicle model consisting of ride, handling, and tire subsystems to study vehicle dynamics behavior in the lateral direction.
- Validated the reduction of unwanted vehicle motions during cornering maneuvers such as body roll angle, body roll rate, vertical acceleration and body heave using MATLAB Simulink.

Suspension System of Solar Electric Vehicle, Team Hyperion June 2019 - May 2020

- Designed the vehicle dynamic system including the geometry construction, wheel assembly & component designing and dynamic performance analysis with SolidWorks, Ansys and Lotus suspension software.
- Simulated MBD (Multibody Dynamics) of suspension using MATLAB Simulink to understand and optimize the vehicle behavior during maneuvers like cornering, bump and droop, acceleration and braking.

ADDITIONAL INFORMATION

Patent: Removable Steering Wheel Mechanism (**IN 202121005948**)

Technical Skills: Vehicle Dynamics, Control Systems, Embedded Systems, MultiBody Dynamics, CAE, CAD

Programming Languages: C, C++, Python, Embedded C, Arduino IDE

Software: MATLAB, Simulink, IPG CarMaker, SolidWorks, CANoe, Trace32, dSpace