Aritra Chakrabarty
CU Boulder Graduate Student

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EDUCATION

University of Colorado - Boulder

Master of Science, Electrical Engineering

GPA - 3.85

Expected Graduation - May 2025

University of Michigan

Bachelor of Science, Mechanical Engineering

GPA - 3.57

Graduation - May 2020

EXPERIENCE

APTIV

Troy, MI

Lead Vehicle Systems Test Engineer

Feb 2022 - June 2023

- Managed testing by planning all testing tasks for vehicle level system testing and was the lead technical contact for team members and interface between the team, customers, test management, and other stakeholders.
- Responsible for aligning scope and milestone based timing, assuring information flow in regards to feature release plan, and monitoring progress on planned testing activities.
- Developed the testing framework by arranging required equipment, test locations/proving grounds access, and driver certification training compliance.
- Provided regular result updates and final test status reports to test management and other stakeholders.
- Evaluated and monitored progress for risks in system testing and communicate said risks to test management.
- Supported development of problem resolution planning and ensured proper error reporting and status tracking.
- Standardised testing methodologies across all projects by establishing baseline concepts and audits, improving test requirement documentation and scrutinising current testing methods, and improving the requirement to test scenario ratio in order to reduce test cycle times.

Vehicle Systems Test Engineer

May 2021 - Jan 2022

- Conducted closed-course vehicle testing on various test tracks and proving grounds. This included instrumenting test vehicles, performing test driving and real time data analysis.
- Specified instrumentation and equipment for test vehicles, including both low- and high-level sensor data.
- Designed, created and implemented automated data analysis MATLAB scripts. This process includes working with cross functional engineering teams to determine which parameters to calculate, writing robust scripts to do the analysis, and then presenting the trends and statistics to engineering teams on a weekly basis.
- Created test procedures, plans and test reports to support all vehicle testing activities.
- Lead on-road Autonomous Vehicle testing in the form of exploratory test trips and regular test routes in several locations, serving data collection and product validation requirements. This process includes designing test routes, interfacing with the Vehicle Operators in each location, detecting trends in the data and performing root-cause analysis on issues found.

Vehicle Systems Integration Engineer

Sep 2020 - Apr 2021

- Brought up ADAS/AD systems on both bench and vehicle level using a familiarity of CAN tools.
- Developed and debugged test system configurations by cooperating with different R&D functions SW, HW, Component Design and Application.
- Identified component integration issues and drove them to resolution by working with cross functional teams.
- Supported vehicle instrumentation setup for recording CAN data, post processing and analysis for bug resolutions and performance improvements.
- Verified system functionality and reported defects on tested functions by performing evaluation drives on a system integration perspective.
- Used an understanding of ADAS/AD architecture, CAN and Ethernet communication, and Vehicle Diagnostics to plan and perform verification testing activities.

SGS IBR Laboratories (Contracted through Kelly Engineering Services)

Grass Lake, MI

Test Engineer I

June 2020 - September 2020

- Performed test procedures from published test methods for filtration systems and masks (NIOSH, AFNOR).
- Calculated and diagrammed detailed test setups according to requirements (flow, velocity, pressures, etc.).
- Selected and calibrated appropriate measurement equipment (flow meters, particle sensors, etc.).

○ Gathered data and compiled it for final test reports with an emphasis on diagnosis and resolution.

University of Michigan   MI

Team Lead - SAE Baja   *September 2018 - April 2020*

○ Led the reports team, which required understanding every advantage of the design points of the vehicle, how to manufacture it, and presenting that information to a team of judges.

○ Designed & built gearbox for power transmission of the system, utilizing catalog-based design to save money.

○ Co-captained team during the 2018 season to build the first car for the team and set up future victories.

Chair of Senate, Student Government   *September 2018 - April 2019*

○ Led a team of Senators to achieve their improvement goals for the university, by setting weekly checkpoints for them and ensuring they were on track with a preset plan.

○ Worked on multiple committees and meetings involving school officials and faculty, in order to get the student voice and ideas across to them.

Research Assistant   *January 2018 - April 2020*

○ Transcribed data to be used in heat analysis. Redesigned the tool and program requirements for transcription work by team.

○ Discovered and set up different methods of blood-based heat flow analysis to be used with an IR camera.

○ Researched and designed an organic Rankine cycle in the form of a Tesla Turbine. This included finding mathematical models, creating a simulation using ANSYS Fluent, and setting up the physical parts for a prototype.

Nexteer Automotive   Saginaw, MI

Electronic Power Steering (EPS) Engineering Intern   *Summer 2016*

○ Designed and experimented on several testing and applications features for Electronic Power Steering systems.

○ Tested functional safety and cutoff features, gathered data from EPS systems for different types of cars, ranging from column assisted to rack assisted EPS systems.

○ Collaborated with OEMs to provide support for EPS systems in production or already in vehicles.

Programming Coursework & Projects

AWS-Deepracer Autonomous Robot   CSCI 5302

○ Enhanced an AWS-Deepracer robot using ROS2 and Python to autonomously navigate around a square hallway. Key tasks included processing LIDAR data for real-time obstacle detection and dynamic route mapping, controlling wheel movements based on PID control algorithms, and implementing Simultaneous Localization and Mapping using the SLAM toolkit for accurate environment mapping and navigation. Collaborated with a team to integrate various software and hardware components, ensuring efficient, real-time data processing and robust autonomous operation, culminating in the fastest lap-time around the track for the class.

Decision Making under Uncertainty Coursework   ASEN/CSCI 5264

○ Implemented Online MDP Methods using Dense Grid World simulations; developed Monte Carlo Policy Evaluation and heuristic policies to enhance baseline performance. Conducted experiments with Monte Carlo Tree Search to optimize decision-making processes.

○ Engaged in the implementation and comparative analysis of tabular reinforcement learning algorithms including Q-Learning and SARSA, crafting learning curves to evaluate efficiencies and computational demands.

○ Modeled a POMDP for cancer monitoring using QuickPOMDPs, executed policy evaluation with Monte Carlo methods, and integrated neural networks to approximate complex functions in reinforcement learning.

○ Developed QMDP and SARSOP solvers for the TigerPOMDP, contrasting heuristic and optimal policies within a cancer monitoring framework to evaluate efficacy and limitations of approximation methods.

○ Formulated high-performance policies and belief updaters for a Lasertag POMDP; employed a combination of heuristic approaches, deep reinforcement learning, and MCTS (Partially Observable Monte Carlo Policy) for adaptive decision-making capabilities.

Machine Learning Coursework   CSCI 5622

○ Analyzed breast cancer data to predict patient survival using K-Nearest Neighbors (K-NN) classifiers, adjusting distance metrics and K values to optimize prediction accuracy based on comprehensive performance metrics (Acc, BAcc, F1).

- Developed a model to predict salinity levels from oceanographic measurements using linear regression, exploring feature correlations and impacts on model accuracy, and employed logistic regression for binary classification of salinity levels.
- Implemented machine learning models for object recognition using the CIFAR-10 dataset, comparing the performance of Feedforward Neural Networks (FNNs) and Convolutional Neural Networks (CNNs) on image classification tasks. Also used LIME in order to explain the model.
- Predicted job hireability from physiological and vocal measures during interviews using Decision Trees and Random Forests, analyzing model decision boundaries and ethical implications of automated hireability assessments.

Technical Skills

Languages: Python, Julia, MATLAB, C++, C
Technologies: ROS2, Vector CAN tools, Polarion, JIRA, Solidworks
Libraries: pandas, NumPy, seaborn, Matplotlib, scikit-learn, TensorFlow, Keras, Hyperopt, Flux.jl, POMDPs.jl
Dev Tools: Git, Google Colab, VS Code