Abhishek **Venkataraman**

Senior Robotics Engineer

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Experience

May Mobility
Ann Arbor, Michigan

Senior Robotics Engineer — *Jun 2018 - Present*

- Architected and deployed a scalable pipeline in AWS/Databricks to ingest field data and calculate metrics to measure autonomy performance
- Architecture lead for interaction with Vulnerable Road Users (VRU)- designed feature from classification to vehicle behavior, team of 3
- Developed end to end semantic classification pipeline for object tracking starting from image acquisition, sensor fusion and temporal tracking
- Spearheaded optimizations for policy rollouts for multi-policy decision-making, enabling 3X speed up of behavior prediction
- Scaled the autonomy stack to work across multiple platforms including Polaris GEM, Lexus, Sienna delivering equivalent ride quality
- Product lead, responsible for software development and deployment for classification of traffic lights with vehicle camera
- Mentored 10+ members of Autonomy and AutoOps, created on-boarding process for new hires, setting them up for success
- Developed tools for multiple teams including DevOps, Tech support: Camera Calibrator, Traffic Light Mapper, Health Monitor, Introspection
- Launched and maintained scalable autonomy software in 9 sites across the US and Japan, generating $1M + in ride revenue

Ather Energy Pvt. Ltd.
Bangalore, India

Senior Engineer — *Jul 2015 - Jul 2016*

- Headed a team of 6, responsible for designing electrical (signal and power) interface between all subsystems, waterproof housings for vehicle dashboard and power distribution unit
- Performed system level DFMEA and incorporated hardware changes to accommodate on-board diagnostics

Schlumberger Asia Services Ltd.
Mumbai, India

Senior Engineer — *Jul 2012 - May 2015*

- Lead Engineer for ONGC offshore wireline operations; carried out over 80 logging jobs as the engineer in charge
- Planned and executed many high profile ($400K revenue/job) operations in offshore oil rigs, lasting over 150 hours while keeping quality and safety as priority, taking critical decisions while operating with limited connectivity to base
- Worked in culturally diverse teams with varied nationalities, heading teams consisting up to 8 crew members

Education

University of Michigan
Ann Arbor, Michigan

Master's in Robotics (GPA: **3.96** / 4.0) — *2016 - 2018*

Indian Institute of Technology Madras
Chennai, India

B.Tech in Mechanical Engineering and M.Tech in Product Design — *2007 - 2012*

Academics

University of Michigan
Ann Arbor, Michigan

Graduate Student Research Associate — *May 2017 - Apr 2018*

- Kinematically-informed Interactive perception [Link], enables robots to classify objects by building 3D models through observations from a RGBD camera while manipulating the object. Method was validated on Toyota's HSR Robot
- SPARE [Link], extendable articulated object RGBD dataset. Method could randomize configurations on Gazebo and provide simulated observations from multiple viewpoints. Implemented DNN (Conv3D/Conv+LSTM, FC) to count links and estimate link lengths on Tensorflow

Graduate Student Instructor, Mathematics for Robotics, (with Prof. Jessy W. Grizzle) — *Sep 2017 - Dec 2017*

- Covered topics in linear algebra including, vector spaces, orthogonal basis, SVD, QR Factorization, BLUE, MVE and Kalman Filters

Graduate Student Instructor, Advanced Topics in Computer Vision (with Prof. Jason J. Corso) — *Jan 2017 - Apr 2017*

- Covered pictorial structures, graphical models, CNN, GAN, RNN, LSTM, auto-encoders. Created weekly in-class and programming assignments

Skills

Language/ Framework	C++, C, Python, Tensorflow, Pytorch, OpenCV, ROS, MATLAB, bash, Gazebo, HTML/CSS/Javascript
Autonomus vehicles/ Robotics	*Perception* - segmentation, object tracking, sensor fusion, localization, *Planning* - Multi policy decision making, backup planning, intent estimation *Tooling* - Camera calibration, 3D mapping, 3D visualization, image annotation, data dashboard
Tools	git, gdb, valgrind, docker, Jenkins CI, heaptrack, vtune, tensorrt, Jira, AWS, Databricks, linux
Courses	Computer Vision, Mobile Robotics (SLAM), Machine Learning, Artificial Intelligence
Hardware interface	*Sensors* - Cameras (RGB, depth), Lidars (Velodyne, Ouster, Cepton), Radar, GPS, IMU, encoders *Platform* - Lexus, Sienna, GEM, Jetson TX2/Nano, Arduino, Raspberry Pi, Nvidia GPU, Fetch, HSR