

# Abhishek Venkataraman

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## EDUCATION

University of Michigan, Ann Arbor, USA

Sep '16 - Apr '18

Master of Science in **Robotics**, current **GPA 4.0/4.0**

(expected)

Indian Institute of Technology Madras (IIT Madras), Chennai, India

June '12

Dual Degree, Bachelor of Technology in Mechanical Engineering & Master of Technology in Product Design

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## EXPERIENCE

University of Michigan, Ann Arbor, Michigan

**Graduate Student Instructor**, Course: **Mathematics for Robotics** (with Prof. Jessy W. Grizzle)

Sep '17 – Dec '17

- Lectured on topics in linear algebra. Set assignments, term exams and held office hours (88 graduate students)

**Research Associate**, (advised by Prof. Jason J. Corso)

May '17 – Aug '17

- Developed **SPARE**, an extendable articulated object RGBD dataset, using simulation environment Gazebo. The method could randomize number of links, their lengths and color and be observed from multiples viewpoints over time. The work was submitted as an academic paper to **ICRA 2018**.
- Proposed **deep learning** architecture (Conv3D/Conv+LSTM, FC) to count links and estimate link lengths(**Tensorflow**)

**Graduate Student Instructor**, Course: **Advanced Topics in Computer Vision** (with Prof. Jason Corso) Jan '17- Apr '17

- Covered pictorial structures, graphical models, **CNN**, **GAN**, **RNN**, **LSTM**, auto-encoders, etc. Created weekly in-class problems, and programming assignments and held office hours (class of 75 graduate students)

Ather Energy Pvt. Ltd., Bangalore, India

Jul '15 – Jul '16

*Tech start-up company designing and manufacturing smart and premium electric scooters*

**Senior Engineer**, Electronics Integration, Vehicle Design

- 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

Jul '12 – May '15

**Senior Field Engineer**, Wireline

- Lead Engineer for ONGC offshore wireline operations; carrying 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 nationality, heading teams consisting up to 8 crew members

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## ACADEMIC PROJECTS

**Directed Research**, (advised by Prof. Jason J. Corso) University of Michigan, Ann Arbor

Sep '17 – Dec '17

- Developed a ROS node for object detection using point cloud data from RGBD camera on **Fetch Robot**.
- Implemented voice commands for Fetch Robot on ROS by creating an Amazon Echo skill.

**Robotics Systems Laboratory**, University of Michigan, Ann Arbor

Jan '17 – Apr '17

- Arm Lab: Implemented a program to compute the forward and inverse kinematics of a 6 DoF arm to manipulate blocks. Block location was tracked real time using RGBD information from a Kinect camera system.
- Flight Lab: Implemented a position outer loop controller for a quadrotor with inputs from a motion capture system. The controller successfully performed position hold, waypoint navigation and could pick-up/drop blocks.

**Digitization of a Chess game using a moving camera**, University of Michigan, Ann Arbor

Sep '16 -Dec '16

- Isolated chess board from background by detecting ArUco markers and applying 2D homographic transformations
- Identified moves using template matching, distance based clustering, color clustering and color histograms

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## SKILLS & COURSEWORK

- **Courses:** Mobile Robotics(SLAM), Advanced / Foundations Computer Vision, Machine Learning, Artificial Intelligence
- **Programming:** Python, MATLAB, C/C++, Tensor-flow, OpenCV, ROS, Gazebo, LCM, Linux OS
- **Hardware:** Fetch Robot, RGBD cameras, Arduino, navigation systems (GPS, IMU), PCB Design

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## DESIGN COMPETITIONS

- **Robocon 2009, Winner** (out of 50 teams). Represented India in the international round held at Tokyo, Japan (Team of 10)
- **DRDO (India), 2nd position** (among 270 teams), Unmanned Aerial Surveillance Vehicle competition 2009 (Team of 7)
- Shaastra, IIT Madras, **1st position**, autonomous robotics competitions in 2008 and 2011 (team of 4)
- Tathva 2008, National Institute of Technology Calicut, **1st position**, autonomous robotics competition (team of 4)