

Aditya Agarwal

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EDUCATION

Carnegie Mellon University, School of Computer Science **Pittsburgh, PA**
Master of Science in Robotics | GPA : 4.11/4.33 **June 2020**

Coursework : Visual Learning, Computer Vision, Machine Learning, Planning in Robotics, Reinforcement Learning

Indian Institute of Technology Kharagpur **Kharagpur, India**
M.Tech. Microelectronics and VLSI Design | B.Tech. Electronics and Electrical Communication **May 2015**

PROFESSIONAL EXPERIENCE

Nimble AI **San Francisco, CA**
Lead Robotics Engineer **July 2020 - Present**

- Responsible for leading research and development in object detection, instance segmentation, pose estimation and motion planning algorithms for robotic picking and packing in warehouses

Robotics Institute, Carnegie Mellon University **Pittsburgh, PA**
Graduate Research Assistant, Search Based Planning Lab (Advisor : Maxim Likhachev) **Oct 2018 - June 2020**

- Developed a fast, scalable and accurate RGBD 6-Dof pose estimation framework for robotic manipulation that combines the strengths of deep learning, computer graphics and optimization; published at IROS 2020
- Transformed an existing 3D perception algorithm to estimate object poses from a set of pose hypotheses using GPU (CUDA/C++); obtained a ~100x speedup and demonstrated new domains for application
- Delivered a software stack (ROS/Python/C++) comprising of planners (arm & base), state machines, controllers & perception modules for a manipulator robot capable of indoor navigation & object retrieval
- Deployed a robust 3D perception-for-manipulation system on the RoMaN platform as part of the RCTA project, which 'hallucinates' possible object poses; collaborated with Army Research Lab engineers for demo

Qualcomm **Bangalore, India**
Senior Engineer **July 2015 - April 2018**

- Transformed an existing Perl/TCL based design flow by incorporating IJTAG for the first time in the company; showed a reduction of 25-30% in design time through automation of a tedious & manual process
- Delivered a standalone Perl/TK based software for analysis of silicon area utilization in SOCs; intercepted 10+ active company wide projects to demonstrate its effectiveness in saving silicon area and cost
- Piloted a scalable and low-power architecture for intra-die spatial yield learning & reducing test data volume

1SpecialPlace **Bangalore, India**
Co-Founder and Chief Technology Officer **Jan 2016 - Dec 2019**

- Created India's first online therapy platform, 'TheraKonnnect' in PHP/Codeigniter capable of handling all aspects of online therapy such as bookings, video conferencing, payments, analytics and medical reporting

PROJECTS

Informed Planning using Conditional Variational Auto-Encoders **CMU | Fall 2019**

- Combined deep learning and graph search to reduce full body planning time by using prior experiences learnt through CVAEs; implemented a Python/C++/ROS pipeline for training, testing & visualization of the method

Visual Learning for Jenga Tower Stability Prediction **CMU | Spring 2019**

- Created a Mask-RCNN + Inception-V4 based deep learning algorithm to predict stability of a Jenga tower on removal of individual tower blocks; obtained post segmentation stability prediction accuracy of 97.20%

Vision based Variable Rate Weed Eradication **IIT Kharagpur | 2014 - 2015**

- Designed a 6 camera system to vary herbicide output based on weed density estimation from color images, cutting chemical usage by 79.5% & achieving efficiency of 90.26%; published in Current Science Journal

Evolutionary Techniques for Test Scheduling in 2D/3D Circuits **IIT Kharagpur | 2014 - 2015**

- Designed an evolutionary algorithm for test scheduling of cores on a 3D IC to minimize overall test time by 51% over SOTA; authored 3 papers in conferences arising from the work; presented at VTS '15 in California

Semi-Supervised Stance Detection in Tweets **CMU | Spring 2019**

- Implemented LDA, Para2Vec and enhanced LDA2Vec for learning better embeddings from unlabelled tweets for stance classification; demonstrated better accuracy than LDA and more explainability than Para2Vec

SKILLS

Programming : C++, Python, Perl, MATLAB, PHP, JavaScript, TCL, Android, Java, React JS, Verilog

Robotics and AI : PyTorch, ROS, PCL, OpenCV, Numpy, Tensorflow, CUDA,, scikit-learn, Pandas