Abhinav Jain

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EDUCATION

Oregon State University — Sept. 2021
PhD, Robotics — *Corvallis, OR, USA*

Advisor: Dr. Cindy Grimm/Co-advisor: Dr. Stefan Lee

Relevant courses: Deep Learning, Learning Based Control, Intro to Robotics, Kinematics and Dynamics

CGPA: 3.95/4

Sardar Vallabhbhai National Institute of Technology — Aug. 2016 – Jul 2020
Bachelor's of Technology, Electronics and Communication Engineering — *Surat, India*

CGPA: 7.62/10

EXPERIENCE

Oregon State University — Dec 2021 - Present
Graduate Research Assistant — *OR, USA*

- Graduate Research Assistant funded under AgAID, which is a collaboration of AI and Agriculture
- Built a simulator called TreeSim_Lpy to emulate tree growth similar to that in an orchard.
- Using the trees generated using the simulator, training a UR5 arm using reinforcement learning to make the arm learn how to prune the tree. Once this model is trained, planning to use Sim2Real to make it work on an actual UR5 arm

Samsung Research Institute, Bangalore — Jan 2021 - Aug 2021
Engineer — *Bangalore, India*

- Engineer in the 5G NR MAC team
- Contributed by writing Unit Tests and Block Tests according to the Google Test framework and increasing the Test coverage metric from 2.1 to 3.2, beyond the required threshold of 3
- Awarded Software Professional Certification for skills in Data Structure and Algorithms

RBCCPS LAB, Indian Institute of Science (IISc) — Jul 2020 – Jan 2021
Research Intern — *Bangalore, India*

- Research Intern at Robert Bosch Centre for Cyber-Physical Systems, IISc Bangalore, under Dr. Chiranjeeb Bhatacharyya.
- Adapted state of the art models of Image Inpainting in PyTorch to the problem of Dynamic to Static LiDAR Reconstruction. Used ROS to run SLAM on the LiDAR output obtained to compare which method adapts better.
- Proposed an architecture for the metric "LiDAR Quality Index", this metric ranked the quality of a LiDAR frame without any reference.
- Explored the literature for "Interpretability in Deep Learning Models". Proposed modifications to TCAV and Automatic Concept Extraction algorithms by using hierarchical clustering to propose better human interpretable concepts.

PUBLICATIONS

Prashant Kumar[1], Sabyasachi Sahoo[1], **Abhinav Jain**, Vanshil Shah, Vineetha Kondameedi, Akshaj Verma, Chiranjib Bhattacharyya, Vinay V. (Sep 2020). "DSLR : Dynamic to Static LiDAR scan Reconstruction using adversarially trained autoencoder". AAAI Conference on Artificial Intelligence 2021 (conference submission)[web-page]

Abhinav Jain[1], Dhruv Patel[1], Kalpesh Prajapati, K.P. Upla. (In Review) "SRTGAN: Triplet Loss based Generative Adversarial Network for Real-World Super-Resolution". CVIP 2022 [Pre-print]

[1]equal contribution

Projects and Extra-Curricular

Fetch-Fetch | *Python, ROS, Deep Learning, Pytorch, OpenCV*
- Advisor: Dr. Cindy Grimm
- In this project, we aim to play a scavenger hunt using an industrial fetch robot.
- We perform SLAM in a known environment, and then use 3D object detection to find the required object and its location
- The arm of fetch is manipulated to grasp the cube [Video]

Drone control using Deep RL | *Python, ROS, Deep Learning, Pytorch, Deep RL, Microsoft AirSim*
- Advisor: Dr. Kagan Tumer
- The aim of the project was for a drone to learn flying in a training environment using Deep Q learning
- The final layers of the Deep Q network were re-trained on a new environment using learning from demonstration by an expert pilot
- The results showed that even with a limited test dataset transfer learning can be used to improve results arline[Paper]

Birding | *Python, Flask, TensorFlow 2, Deep Learning*
- Advisor: Dr. K.P. Upla
- The project aimed to convert a given text description of a bird into the corresponding image. Collaborated i n a team of 4 to complete this project.
- Generative Adversarial Networks were used to convert the text description into an image, used the concept of self-attention to improve on results.[GitHub]

Seminar: Synthesis of Data using Deep Learning Techniques
- Advisor: Dr. Z.M. Patel. The seminar covered the techniques like Auto Encoders, Variational Autoencoders, GANs, DCGANS, cGANS to generate new data based on a dataset.[Seminar Report][Seminar Presentation]

Predicting upcoming Coronavirus Hotspots | *Python, Scikit-Learn, Machine Learning*
- Implemented clustering algorithms like DBSCAN and K-Means to identify coronavirus hotspots. Data from people not tested but showing symptoms can be used to predict potential clusters.[Blog Post]

Robocon 2018 | *C, C++, Embedded Systems, Control Systems, Arduino, AVR*
- Robocon is a robotic contest organized by Asia-Pacific Broadcasting Union (ABU).
- Part of a 20-man team and personally handled the autonomous motion for a 3-wheel holonomic drive via feedback from various sensors like LSA line sensor, Gyroscope, IMUs, encoders.
- Secured 12th rank in the nationals out of 120 participating colleges. Video:(Blue Team) [Video]

Courses and Certifications

Deep Learning Specialization, Coursera
- Course 1: Neural Networks and Deep Learning [certificate]
- Course 2: Improving Deep Neural Networks [certificate]
- Course 4: Convolutional Neural Networks [certificate]
- Introduction to Tensorflow [certificate]

Stanford University Machine Learning, Coursera [certificate] Score: 96.7%

Harvard CS50x, EdX No certification

Technical Skills

Languages: Python, C, C++, Embedded C, Git
Frameworks: Flask, PyTorch, TensorFlow, Keras, ROS
Libraries: pandas, NumPy, Matplotlib, OpenCV