Aseem Saxena

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EDUCATION

Oregon State University Corvallis, OR
M.S in Artificial Intelligence | GPA: 3.89/4.0 March 2021 - Expected June 2024
Courses Taken: Reinforcement Learning, Deep Learning, Algorithms, Optimization, Probabilistic Graphical Models
Areas of Research: ***Offline RL, Multi-Task Learning, AI Safety, Bipedal Robots***

Birla Institute of Technology and Science, Pilani India
B.E in Electrical & Electronics Engineering, M.Sc in Biological Sciences (Dual Major) | GPA: 7.34/10 2011- 2016

SKILLS

Programming: Python (10+ years exp.), MATLAB (9+ years exp.), C/C++ (9+ years exp.), JAVA (9+ years exp.)
Software and Libraries: PyTorch, OpenCV, ROS, Mujoco, TensorFlow, Git, Gazebo, Point Cloud Library, Docker, Ray, Isaac

EXPERIENCE

Oregon State University 06/2021 – Present
Graduate Research Assistant - *Prof Alan Fern*

Offline RL

- We study how different farmer strategies work across different farms (without access to a simulator) via learning a Multi-Dynamics World Model and show that this World Model incurs negative interference under limited data, undermining generalization. Skills - ***Pytorch, World Models, Crop Simulators, Model-based Off-Policy Evaluation***

Multi-Task Learning

- Developed a model for Grape Cold-Hardiness Prediction that consistently outperform the state-of-the-art scientific model with just thirty seasons of data for any cultivar. Our work is deployed on **AgWeatherNet** which is used daily by 14K subscribers. Published research at Machine Learning Journal (Under Review)[1] , AAAI 2023[2], AIAFS 2023[3]. Skills - ***Pytorch, RNNs***

Sim2Real RL for Bipedal Robots

- Developed an RL formulation for training dynamic gait controllers that can respond to specified touchdown locations. Published research at IEEE ICRA 2022. [4] Skills - ***Pytorch, Mujoco***

AI Safety

- Proposed a formal criterion for avoiding side effects in environments and demonstrated its effectiveness via evaluation on gridworlds. Published research at NeurIPS ML Safety Workshop 2022. [5] Skills - ***Pytorch, AI Safety Gridworlds***

Teaching

- Teaching Assistant ME 430 Systems Dynamics and Control, Fall 2021 - Held weekly office hours and graded assignments.

Panasonic Singapore AI Engineer - *Technology Innovation Team* 01/2019 – 01/2021

- **Bayesian Optimization** for **Material Design** - With just a single trial, obtained a material having properties similar to another material obtained over a period of 2 years. Skills - ***Pytorch, Gaussian Processes***
- **Edge Deployment** of Deep Learning Models - Successfully deployed deep vision models on dated Android TV boxes with lower computational resources, achieving a 30 FPS. Skills - ***Pytorch, OpenCV, TensorFlow, Android 6.0, ONNX***
- Real-time **Multi-Object Tracking** - Developed a 50+ FPS tracker using Kalman Filters for state estimation and Hungarian algorithm for data association. Tracker deployed on test run in a busy retail shop. Skills - ***C++***
- Deep Learning for **Gaze Estimation** - Trained a robust gaze model entirely on synthetic images and successfully deployed on a beta trial in a busy retail shop. Skills - ***Unity, Pytorch***

National University of Singapore Research Staff - *Prof David Hsu* 09/2017 – 06/2018

- **Imitation Learning** for **Autonomous Driving** in Unstructured Environments - Published research at Robotics: Science and Systems (RSS) 2019. [6] Skills - ***Pytorch, C++, Unity***

Ducere Technologies Pvt Ltd Computer Vision Engineer 07/2016 – 04/2017

- Developed a **Low cost LiDAR system** using a Teraranger One ToF sensor on a pan tilt unit for 3D scanning. Skills - ***Point Cloud Library***

International Institute of Information Technology, Hyderabad India Research Staff - *Prof Madhava Krishna*
04/2017- 07/2017, 06/2015 – 07/2016

- **Mahindra Driverless Car Challenge** - Robust system for traffic sign detection, recognition and tracking. Skills - ***OpenCV, C++***
- **End-to-end learning** based approach for **visual servoing** in diverse scenes **-** Published research at ICRA 2019. [7] Skills - ***Caffe, OpenRAVE, MATLAB***

COURSE PROJECTS

- Avoiding Side Effects in Complex Navigation Environments via Multi-Task Learning **[Slides]**
- Distributed Q-Learning with Ray Framework **[Code]**
- Offline-RL for Bipedal Robots **[Report]**
- Studying Robustness of Semi-supervised Visual Features to Adversarial Attacks **[Report]**
- MC Dropout for Efficient RL Exploration **[Report]**

EXTRACURRICULAR

- Musician **[Youtube]**, Amateur Triathlete **[Certificate]**