

# Aseem Saxena

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## EDUCATION

<b>Oregon State University</b> M.S in Artificial Intelligence   GPA: 3.89/4.0 <i>Courses: Reinforcement Learning, Deep Learning, Algorithms, Optimization, Probabilistic Graphical Models</i> <i>Research: Multi-Task Learning, Offline RL, AI Safety, Bipedal Robots</i>	Corvallis, OR Mar '21 - Expected Jun '24
<b>Birla Institute of Technology and Science, Pilani</b> B.E in Electrical & Electronics Engineering, M.S in Biological Sciences (Dual Major)	India 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

<b>Oregon State University Graduate Research Assistant, Prof. Alan Fern</b> <ul style="list-style-type: none"><li><b>Multi-Task Learning</b> - Developed a model for Grape Cold-Hardiness Prediction that consistently outperforms the state-of-the-art scientific model with just thirty seasons of data for any cultivar. Our work is deployed on <b>AgWeatherNet</b> which is used daily by 14K subscribers. We show that MTL is effective for other crops and other crop traits. Submitted to ML Journal [1] and published at AIAFS 2023[2] and IAAI 2023[3]. <b>Pytorch, RNNs</b></li><li><b>Sim2Real RL for Bipedal Robots</b> - Developed an RL controller for dynamic gaits that can respond to specified goal foot locations. Trained a model to check if a footprint is feasible. Transferred to the real world from simulation via randomizing the parameters of the simulation. Published at <b>ICRA 2022</b>. [4] <b>Pytorch, Mujoco</b></li><li><b>AI Safety</b> - Proposed a formal criterion for avoiding side effects in environments and demonstrated its effectiveness via evaluation on gridworlds. Published at <b>NeurIPS ML Safety Workshop 2022</b>. [5] <b>Pytorch, AI Safety Gridworlds</b></li><li><b>Forecasting (Ongoing)</b> - Casting forecasting as a multi-task learning problem wherein each task corresponds to a forecast day. Showed promising results for Soil temperature Forecasting. Plan to deploy on AgWeatherNet. <b>Pytorch</b></li><li><b>Offline RL</b> - 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. <b>Pytorch, World Models, Crop Simulators, Model-based Off-Policy Evaluation</b></li><li><b>Teaching</b> - Systems Dynamics and Control, Fall 2021 with weekly office hours and evaluation duties.</li></ul>	Jun '21 – Present
<b>Panasonic Singapore AI Engineer, Technology Innovation Team</b> <ul style="list-style-type: none"><li><b>Bayesian Optimization for Material Design</b> - With just a single trial, obtained a material having properties similar to another material obtained with over 20 trials conducted in a period of 2 years. <b>Pytorch, Gaussian Processes</b></li><li><b>Edge Deployment</b> of Deep Learning Models - Successfully deployed vision models on dated Android TV boxes with lower computational resources, achieving a 30 FPS. <b>Pytorch, OpenCV, TensorFlow, Android 6.0, ONNX</b></li><li>Real-time <b>Multi-Object Tracking</b> - 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. <b>OpenCV, C++</b></li><li>Deep Learning for <b>Gaze Estimation</b> - Trained a robust gaze prediction model entirely on synthetic images, fine-tuned on real images and successfully deployed on a beta trial in a busy retail shop. <b>Unity, Pytorch</b></li></ul>	Jan '19 – Jan '21
<b>National University of Singapore Research Staff, Prof David Hsu</b> <ul style="list-style-type: none"><li>Autonomous Driving in a Crowd by <b>Learning from Tree Search</b> - Published at <b>RSS 2019</b>. [6] <b>Pytorch, C++, Unity</b></li><li>Developed a feature rich <b>visualization tool</b> to debug <b>QMDPNet</b>, an approx. POMDP Solver. <b>TensorFlow, Tkinter</b></li><li>Developed a <b>robust position and velocity controller</b> for the Fetch Robot for indoor navigation. <b>ROS, C++</b></li></ul>	Jan '17 – Jun '18
<b>Ducere Technologies, India Computer Vision Engineer</b> <ul style="list-style-type: none"><li>Developed a <b>Low cost 3D LiDAR</b> system using Teraranger One ToF sensor on a pan-tilt unit. <b>Point Cloud Library</b></li></ul>	Jul '16 – Apr '17
<b>IIIT Hyderabad, India Research Staff, Prof Madhava Krishna</b> <ul style="list-style-type: none"><li>Developed a robust system for <b>traffic sign detection, recognition and tracking</b> as part of a driverless car challenge for Indian automobile manufacturing company - Mahindra. Deployed and tested on a car. <b>OpenCV, C++</b></li><li><b>Learning</b> based approach for <b>Visual Servoing</b> - Published at <b>ICRA 2017</b>. [7] <b>Caffe, OpenRAVE, MATLAB</b></li></ul>	Apr '17- Jul '17, Jun '15 – Jul '16

## 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]