Gautham Narayan Narasimhan

gauthamn@cs.cmu.edu

Education

- **Carnegie Mellon University** — Pittsburgh, PA
  Master of Science - Robotics Concentration — *Aug. 2018 – May. 2020*
- **Vellore Institute of Technology** — Vellore, India
  Bachelor of Technology in Mechanical Engineering — *Aug. 2013 – July. 2017*

Publications

ROLL: Visual Self-Supervised Reinforcement Learning with Object Reasoning
Yufei Wang*, **Gautham Narayan***, Xingyu Lin, Brain Okorn, David Held
Conference on Robot Learning (CoRL), 2020

Segmentation for learning image based goal conditioned policies
Gautham Narayan, David Held
Master's thesis - Carnegie Mellon University, 2020

Experimental Droplet Spatter Analysis Using Least Squares Approximation
Gautham Narayan, Bill Eddy
Internal Report - NIST Center of Excellence in Forensic Science, 2020

Effect of winglets induced tip vortex structure on the performance of subsonic wings
Gautham Narayan, Bibin John
Elsevier - Aerospace Science and Technology, 2016

** denotes equal contribution*

Research and Work Experience

- **Robot Perception Lab - CMU** — Pittsburgh, USA
  Research Assistant with Prof. David Held — *June 2020 - Present*
  - Utilized self supervised unknown object segmentation to improve sample efficiency, goal sampling and RL policy performance on a range of manipulation tasks
  - Presented a novel matching loss along with VAE+LSTM architecture that improved robustness to occlusions at CoRL 2020
  - Executed Sim2Real transfer of a learnt policy on Franka Panda arm
  - Currently working on a differentiable simulator to learn a particle dynamics model for granular/liquid media
  - Currently working on model based reinforcement learning combined with online model learning
- **Robot Perception Lab - CMU** — Pittsburgh, USA
  Master's thesis with Prof. David Held — *September 2018 - June 2020*
  - Improved performance and sample efficiency of image based reinforcement learning algorithms using segmentation.
  - Transferred human demonstrations to robots through imitation learning.
  - Worked with Sawyer Robots for large scale segmentation data collection.
  - Worked on a grasping end effector system for cloth manipulation using pinch grasps.

- **General Motors Collaborative Research Lab - CMU** Pittsburgh, USA
  Research Assistant with Prof. Raj Rajkumar *November 2018 - January 2019*
  - Created a pointcloud dataset using Velodyne VLP16 LiDAR within the CMU campus
  - 3D reconstructed surfaces of cars and pedestrians using PCL Poisson Solver.
  - Utilized PointNet and VoxelNet for detecting cars and pedestrians around the CMU campus.
  - Further utilized predicted bounding boxes to improve surface reconstruction around pedestrians.
- **Image and Video Understanding Lab - KAUST** Jeddah, SA
  Visiting Research Student *September 2017 - February, 2018*
  - Implemented state of the art Imitation Learning algorithms for autonomous flying using Tensorflow.
  - Utilised MaskRCNN and SORT for realtime object detection and tracking.
  - Programming using C++ and visual scripting within Unreal game engine for a photo-realistic simulator.
  - Implemented high speed TCP socket communication between Unreal and Tensorflow for real time image transfer during training and testing.
  - Solved and submitted fast algorithms for reinforcement learning problems in OpenAI Gym.

Programming Skills

Programming Languages: C/C++, Python, Matlab

Open-Source Frameworks: Tensorflow, PyTorch, OpenCV, ROS, Point Cloud Library(PCL)

Robots Sensors: Franka Panda, Rethink Sawyer, Azure Kinect, Kinect v2, Realsense, Primesense