Dhruv Sharma

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https://github.com/d32sharm

Skills

Software: C, C++, MATLAB, Python, TensorFlow, PyTorch, CUDA, ROS, Gazebo, Unreal Engine
Hardware: NVIDIA Tegra - Jetson TX1, Drive PX, Data Acquisition Systems, Raspberry PI, Arduino

Interests

Intelligent Robotics, Artificial Intelligence, Autonomous Mobile Robots, Computer Vision

Research Publication

Sharma, D., Kuwajerwala, A., Shkurti, F. (2022). Augmenting Imitation Experience via Equivariant Representations. *IEEE International Conference on Robotics and Automation (ICRA 2022).* (Text)

Sharma, D., Zafar, S., Tizhoosh, H., Babaie, M. (2018). Facial Recognition with Encoded Local Projections. *IEEE-Symposium Series on Computational Intelligence 2018.* (Text)

Work Experience

Huawei Canada, Noah's Ark Lab — Toronto, ON
Computer Vision Researcher — June 2022 | Present

- Research in camera/lidar based perception for autonomous driving.
- Explored and implemented Neural Radiance (NeRF) and related research for AV simulation.
- Trained neural rendering models for static and dynamic scenes with a focus on 3d geometry.

Convolve AI Inc. — Toronto, ON
AI Consultant — April 2022 | Present

- Built software tools for businesses and helped integrate AI and automation in workflows.
- Integrated openAI GPT based Large Language Models in lead gen tools.
- Leverated chatgpt and other openAI tools to improve productivity and customer interactions.

Prof Florian Shkurti, University of Toronto — Toronto, ON
Graduate Student Researcher — Sept 2019 | March 2021

- Research at the intersection of robotics, artificial intelligence, and computer vision.
- Developed novel techniques to enhance the state of the art in robotics, and empowering robots to perform with minimal supervision and training.
- Worked on improving robot navigation using imitation learning combined with enhanced visual scene understanding.
- Acted as a teaching assistant for CSC321 Neural Networks and Machine Learning (Winter 2021). Delivered tutorials to 4th year CS students and graded papers.

NVIDIA — Holmdel, NJ
Software Engineer - Autonomous Driving — Oct 2018 | Oct 2019

- Worked on End to End learning for self-driving cars. Developed infrastructure for training and validation and trained and tested several models.
- Contributed to the development of the self driving simulator. Created and deployed new features for model testing and evaluation.

Prof Krzysztof Czarnecki, University of Waterloo — Wateroo, ON
Research Engineer - Waterloo Self-Driving Car Project — July 2018 | Sept 2018

- Simulation based research in autonomous driving using Coppelia Robotics V-rep simulator and Unreal Engine based simulator.
- Significantly contributed in integrating the dynamic vehicle model for the car developed using MapleSim into the simulation pipeline.

Prof Hamid Tizhoosh, University of Waterloo Waterloo, ON
Research Project Student Jan 2018 | June 2018

- Conducted research in facial recognition under the supervision of Prof Hamid Tizhoosh. Developed a projection based algorithm (Encoded Local Projections) to face recognition.
- Successfully obtained desired results and published the work in the IEEE-Symposium Series on Computational Intelligence 2018.

NVIDIA Holmdel, NJ
Deep Learning Intern - Autonomous Driving May 2017 | Sep 2017

- Worked on developing autonomous driving technology on NVIDIA Drive PX 2. Gained experience in perception applied to autonomous driving.
- Integrated navigation using maps and GPS into the autonomous driving pipeline.
- Implemented in C++, fusion of GPS and IMU using EKF to derive better orientation estimates.

NVIDIA Holmdel, NJ
Deep Learning Intern - Autonomous Driving Aug 2016 | Dec 2016

- Trained and tested on road, several end to end deep neural networks that were demonstrated at various international trade shows and conferences. Ran experiments to improve the network performance.
- Wrote CUDA kernels to improve the performance of the in house augmented driving simulator.
- Created a speed control application for the car to cruise at speeds below 20 mph - the range where inbuilt ACC of the car does not work.

NVIDIA Santa Clara, CA
Infrastructure Software Engineer Jan 2016 | Apr 2016

- Participated in creation and approval process of schematic symbols (Cadence Allegro Designer).
- Created test setup to characterize sense resistors. Analyzed parts from different vendors based on performance, cost, and lead time.
- Created interactive dashboards to improve the state of engineering processes across the company (Tableau Desktop).

Capital One Kitchener, ON
Data Scientist May 2015 | Aug 2015

- Natural Language Processing using Sklearn to analyze customer text feedback.
- Built text classification pipeline (feature extraction, feature selection, classifcation - Linear Support Vector Classifier). Performed sentiment analysis on comments.

Education

University of Toronto Toronto, ON
Master of Science: Computer Science 2019 - 2021
Research at the intersection of Autonomous Robotics and Artificial Intelligence
CGPA: 4.0

Projects
- Augmenting Imitation Experience via Equivariant Representations
- Cartpole Control using Deep Q-Learning
- Monocular visual odometry on KITTI dataset

University of Waterloo Waterloo, ON
Bachelor of Applied Science: Honours Mechatronics Engineering 2013 - 2018
Average: 89.78% (Dean's Honours List)

Capstone Design Project
- Autonomous wall painting robot - mapping, localiztion, planning, controls. (trymist.com)
- Awarded for best technical content ($1000). Robot featured in TechCrunch (Link)

Relevant Courses
Perception for Robotics, State Estimation for Robotics, Control for Robotics, Machine Intelligence, Autonomous vehicles, Multisensor Data Fusion, Autonomous Mobile Robots, Image Processing, Digital Control Systems

Honors and Awards

Ontario Graduate Scholarship — UToronto
Granted the Ontario Graduate research Scholarship ($15000) — 2019 - 2020

Best Technical Content, Mechatronics Design Symposium — UWaterloo
Team awarded for capstone project MIST robot ($1000). — 2018

President's International Experience Award — UWaterloo
Awarded for excelling at international internships ($1500). — 2018

President's Research Award — UWaterloo
Awarded for excelling at research internship ($1500). — 2015

3rd Place, Waterloo Engineering Senior Design Competition — WEC
Team awarded 3rd place in senior design competition. — 2014

First in Class Engineering Scholarship — UWaterloo
Rank 1 in class of 150 students in summer 2014 term ($500). — 2014

3 x Deans Honours List — UWaterloo
Recognized on the deans honor list due to academic excellence. — 2014 - 2018

University of Waterloo President's Scholarship of Distinction — UWaterloo
Entrance award for high admission average ($2000). — 2013