Dhruv Sharma

82 Rochefort Street, Kitchener ON · d32sharm@gmail.com · 226-606-0988 ·
https://ca.linkedin.com/in/dhruvsharmauw
https://d32sharm.github.io/

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

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

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

Interests

Computer Vision, 3D Reconstruction, Neural Rendering, 3D Geometry, Autonomous Robotics, Artificial Intelligence, Generative AI

Research Publication

Khan, M., Fazlali, H., Sharma, D., Cao, T., Feng, B., Ren, Y., Liu, B. (2024). AutoSplat: Constrained Gaussian Splatting for Autonomous Driving Scene Reconstruction. *Under Review (ECCV 2024)*

Zhang, W., Elmahguibi, M., Rezaee, K., Khamidehi, B., Mirkhani, H., Arasteh, F., Li, C., Kaleem, MA., Corral-Soto, E., Sharma, D., Cao, T. (2024). Analaysis of a Modular Autonomous Driving Architecture: The Top Submission to CARLA Leaderboard 2.0 Challenge. *Under Review (IROS 2024)*

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

- Developed and implemented novel algorithms for 3D Scene Reconstruction using Neural Radiance Fields and 3DGS with a focus on Autonomous Driving Scenes. Re-implemented ideas from SOTA methods in literature.
- Conducted research on NeRF and Gaussian Splatting based rendering for dynamic driving scenes de-coupling static and dynamic parts of the scene. Devised and tested methods to render background and foreground separately.
- Applied techniques to improve the Rendering and 3D Reconstruction with special focus on 3D Scene Geometry.
- Worked with 3D Gaussian Splatting based methods for simulating and rendering novel views with RGB and Lidar/Pointcloud.

University of Toronto @ Robot, Vision & Learning Lab — Toronto, ON
Graduate Student Researcher — Sept 2019 | March 2021

- Researched, under the supervision of Prof. Florian Shkurti, methods to improve end to end learning for control of an autonomous vehicle using learnt data augmentation techniques.
- Worked on improving robot navigation using imitation learning via Equivariant Representations. Performed experiments in simulation and real robot to showcase the effectiveness of the method. Paper published in ICRA 2022 (Text)
- Taught and assisted with 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 building on top of this work by NVIDIA. Advised by Dr. Urs Muller and Dr. Beat Flepp.
- Developed infrastructure for training and validating models. Trained and tested several models in different environments and lighting conditions to test for robustness.
- Contributed to the development of the Simulator to test AV models. Created and deployed new features for model testing and evaluation.

University of Waterloo @ WISE Lab Wateroo, ON
Research Engineer - Waterloo Self-Driving Car Project July 2018 | Sept 2018

- Worked on autonomous driving simulation research at the Waterloo Intelligent Systems Engineering Lab under the supervision of Prof. Krzysztof Czarnecki.
- 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.

University of Waterloo @ Prof Hamid Tizhoosh 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 (Text).

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

- Worked on developing autonomous driving technology on NVIDIA Drive PX 2. Gained experience in computer vision and perception in 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 - 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, conferences demonstrations. 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.

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