

# DHRUV SHARMA

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<https://github.com/d32sharm>

## SKILLS

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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

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

## RESEARCH PUBLICATION

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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

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### Prof Florian Shkurti, University of Toronto

*Graduate Student Researcher*

Toronto, ON

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

*Software Engineer - Autonomous Driving*

Holmdel, NJ

Oct 2018 | Oct 2019

- Part of NVIDIA's research group developing end to end deep networks for autonomous driving
- Contributed to the development of the self driving simulator as well as additional infrastructure to train and test networks.

### Prof Krzysztof Czarnecki, University of Waterloo

*Research Engineer - Waterloo Self-Driving Car Project*

Waterloo, ON

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

*Research Project Student*

Waterloo, ON

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

*Deep Learning Intern - Autonomous Driving*

Holmdel, NJ

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***Deep Learning Intern - Autonomous Driving*

Holmdel, NJ

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***Infrastructure Software Engineer*

Santa Clara, CA

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***Data Scientist*

Kitchener, ON

May 2015 | Aug 2015

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

**DieboldNixdorf***Software Developer*

London, ON

Sep 2014 | Dec 2014

- Software development for VistaATM (C++) ATM terminal software. Developed new functionalities.
- Created unit tests using Google's GTEST and GMOCK framework.

**EDUCATION**

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**University of Toronto**

Master of Science: Computer Science

Research at the intersection of Autonomous Robotics and Artificial Intelligence

CGPA: 4.0

Toronto, ON

2019 - 2021

*Projects*

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

**University of Waterloo**

Bachelor of Applied Science: Honours Mechatronics Engineering

Average: 89.78% (Dean's Honours List)

Waterloo, ON

2013 - 2018

*Capstone Design Project*

- Autonomous wall painting robot - mapping, localization, 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

## ACTIVITIES

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### **Social Entrepreneur - Effizient**

*Founder and Director*

Kitchener, ON  
Feb 2020 | Present

- Helping students, workers, and other newcomers in Canada with government procedures.
- Providing free support and information online via social media - Tiktok (11k+ followers), Facebook groups (14k+ members).

## HONORS AND AWARDS

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### **Ontario Graduate Scholarship**

Granted the Ontario Graduate research Scholarship (\$15000)

UToronto  
2019 - 2020

### **Best Technical Content, Mechatronics Design Symposium**

Team awarded for capstone project MIST robot (\$1000).

UWaterloo  
2018

### **President's International Experience Award**

Awarded for excelling at international internships (\$1500).

UWaterloo  
2018

### **President's Research Award**

Awarded for excelling at research internship (\$1500).

UWaterloo  
2015

### **3rd Place, Waterloo Engineering Senior Design Competition**

Team awarded 3rd place in senior design competition.

WEC  
2014

### **First in Class Engineering Scholarship**

Rank 1 in class of 150 students in summer 2014 term (\$500).

UWaterloo  
2014

### **3 x Deans Honours List**

Recognized on the deans honor list due to academic excellence.

UWaterloo  
2014 - 2018

### **University of Waterloo President's Scholarship of Distinction**

Entrance award for high admission average (\$2000).

UWaterloo  
2013