

ASHISH GAURAV

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Google Scholar: scholar.google.ca/citations?user=5CqEn6YAAAAAJ

EDUCATION

University of Waterloo, Canada *Sep 2020 - current*
Ph.D. Candidate, Computer Science *GPA: 93.5%*
Supervisor: Dr. Pascal Poupart, Professor, University of Waterloo

University of Waterloo, Canada *Sep 2017 - Jan 2020*
M. Math., Computer Science *GPA: 89.75%*
Supervisor: Dr. Krzysztof Czarnecki, Professor, University of Waterloo
Thesis: Safety-Oriented Stability Biases for Continual Learning

Birla Institute of Technology Mesra, India *Sep 2013 - Apr 2017*
B. Engg., Computer Science *GPA: 8.95/10.0*
First Class with Distinction (Batch Rank: 3 in 137 CS students)
Thesis: A New Sorting Algorithm on OTIS-MOT

Chiranjiv Bharati School, Palam Vihar, India *Apr 2001 - Mar 2013*
Primary, Middle and High School

EXPERIENCE

Research Assistant, Waterloo AI Group *Sep 2020 - current*
Location: Waterloo, Canada
Conducting research on inverse reinforcement learning, constraint learning, causality.

Research Intern, Vector Institute *Jul 2020 - Aug 2020*
Visiting Researcher, Waterloo AI Group *March 2020 - Jun 2020*
Location: Waterloo, Canada
Conducted research on reinforcement learning, transformer networks and credit assignment.

Research Assistant, Waterloo Intelligent Systems Engineering Lab *Sep 2017 - Feb 2020*
Location: Waterloo, Canada
Conducted research in safe reinforcement learning, planning for autonomous driving, continual learning and out-of-distribution detection. Also designed the “high-level behavior planning” module (ROS/C++) for autonomoose, Waterloo’s self driving car project, which led to two successful driving demos.

Teaching Assistant & Instructional Apprentice, University of Waterloo *Sep 2017 - current*
Location: Waterloo, Canada
Performed exam & assignment marking, proctoring and conducted tutorials:
CS135: Designing Functional Programs (Fall 2020)
CS136: Elementary Algorithm Design and Data Abstraction (Fall 2017, Winter 2019)
CS145: Designing Functional Programs, Advanced Version (Fall 2019)
CS486: Introduction to Artificial Intelligence (Winter 2018)
CS885: Reinforcement Learning (Fall 2021, Winter 2022)

Subject Matter Expert, University of Toronto (*part-time, remote*) *Jul 2018 - Oct 2018*
Supervisor: Dr. Steven Waslander, Associate Professor, University of Toronto
Designed content, including presentations, structure and scripts for three teaching modules in the Coursera Self-Driving Cars Specialization.

Software Engineering Intern, Google *May 2016 - Jul 2016*
Location: Mountain View, United States
Host: Andrew de los Reyes, Software Engineer, Google
(Non disclosure) Worked on sandboxing technology for Chrome OS.

PUBLICATIONS

Transfer RL for Autonomous Driving: From WiseMove to WiseSim
A Balakrishnan, J Lee, *A Gaurav*, K Czarnecki, S Sedwards
ACM Transactions on Modeling and Computer Simulation, Vol. 31, Issue 3
dl.acm.org/doi/abs/10.1145/3449356

Simple Continual Learning Strategies for Safer Classifiers
A Gaurav, S Vernekar, J Lee, V Abdelzad, K Czarnecki, S Sedwards
Workshop on AI Safety (SafeAI), AAAI 2020
ceur-ws.org/Vol-2560/paper6.pdf

Out-of-distribution Detection in Classifiers via Generation
S Vernekar, *A Gaurav*, V Abdelzad, T Denouden, R Salay, K Czarnecki
Safety & Robustness in Decision Making Workshop, NeurIPS 2019
arxiv.org/abs/1910.04241

WiseMove: A Framework to Investigate Safe Deep RL for Autonomous Driving
J Lee*, A Balakrishnan*, *A Gaurav**, K Czarnecki, S Sedwards*
International Conference on Quantitative Evaluation of Systems 2019
link.springer.com/chapter/10.1007/978-3-030-30281-8_20

Design Space of Behaviour Planning for Autonomous Driving
M Ilievski, S Sedwards, *A Gaurav*, A Balakrishnan, A Sarkar, J Lee, F Bouchard, R Iaco, K Czarnecki
arxiv.org/abs/1908.07931

Analysis of Confident-Classifiers for Out-of-Distribution Detection
S Vernekar*, *A Gaurav**, T Denouden, B Phan, V Abdelzad, R Salay, K Czarnecki
Safe Machine Learning Workshop, ICLR 2019
arxiv.org/abs/1904.12220

SELECTED COURSE REPORTS

Spotify-viz, an interactive visualization system (CS 889)
Bayesian neural networks, for adversarial attack and defense (CS698)
Causal discovery for small graphs, using probabilistic programming (CS 842)
Causal discovery algorithms, a survey (CS 886)
Flappy bird, applying bootstrapped DQN with UCB (STAT 946)
Capsule networks, reproducing Sabour et al. (2017) and some critique (STAT 841)

SELECTED PROJECTS

WiseMove, Hierarchical RL framework to investigate safety (git.uwaterloo.ca)
GridDriving, Gym simulator for RL experiments, based off CarRacing-v0 (github.com)
SSH Scan, vulnerability scanner, *part of*: Mozilla Winter of Security 2016 - 2017 (blog.mozilla.org)
Perl for NaCl, porting Perl, *part of*: Google Summer of Code 2015 (google-melange.com)

ACTIVITIES

Vice President, Data Science Club, University of Waterloo *Jan 2019 - Dec 2019*
Conducted several talks and tutorials on machine learning frameworks, reinforcement learning, autonomous driving. Also conducted a reading group on reinforcement learning.

Student Network Administrator, Birla Institute of Technology Mesra *Sep 2016 - Apr 2017*
Administrator for data sharing Peer-to-Peer network. Also coordinated student projects, gave talks on Linux and open source software and conducted a multi-college hackathon.

SKILLS

Programming Languages and Frameworks

Proficient: Python, C, C++

Moderate proficiency: JavaScript

Frameworks: Pytorch, Keras, Tensorflow

Languages

English & Hindi

AWARDS, SCHOLARSHIPS & ACHIEVEMENTS

Vector Institute Student Research Grant *Jan 2021 - Dec 2021*
Graduate Excellence Award, CS *Sep 2020 - Dec 2020*
International Doctoral Student Award *Sep 2020 - current*
NSERC CREATE for Cyber-Physical Systems, Student Grant *May 2018 - Dec 2019*
University of Waterloo Graduate Scholarship *Sep 2017 - Aug 2018*
International Masters Student Award *Sep 2017 - Dec 2019*
India Finalist, Microsoft Build the Shield (Hyderabad) *March 2016*
Academic Scholar, Chiranjiv Bharati School *2009 - 2012*
All India Rank 37, EduHeal Cyber Olympiad *2008*