

KARUSH SURI

[LinkedIn](#) ◊ [Google Scholar](#) ◊ [GitHub](#)

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RESEARCH INTERESTS

Karush is a Deep Learning Researcher at Huawei Noah's Ark Lab in Toronto. His research focuses on developing novel intelligent agents for Energy-based Reinforcement Learning and Probabilistic Control.

EDUCATION

University of Toronto

Master of Applied Science (M.A.Sc)

2019 - 2021

Toronto, Canada

- Department: Electrical & Computer Engineering
- Thesis: Deep Hierarchical Reinforcement Learning ([link](#)) ([video](#))
- Advisors: Prof. Yuri A. Lawryshyn & Prof. Konstantinos N. Plataniotis
- GPA: 4/4

Amity University

Bachelor of Technology (B.Tech)

2015 - 2019

Delhi, India

- Department: Electronics & Communication Engineering
- Thesis: Application of Deep Learning & Game Theory for Sign Language Recognition using Wearable Sensors ([link](#))
- Advisor: Prof. Rinki Gupta
- GPA: 8.78/10

SCHOLARSHIPS & AWARDS

University of Toronto, Canada

Electrical & Computer Engineering Fellowship

2020-2021

Edward S. Rogers Graduate Scholarship

2019-2020

Amity University, India

Best in Technical Innovation Award (class of 2015-2019)

2019

Most Frugal Innovation Award

2018

100% Curriculum Merit Scholarship

2015

Others

Young Achievers Award

2015

RESEARCH APPOINTMENTS

Huawei Noah's Ark Lab

Deep Learning Researcher

2021 - Present

Toronto, Canada

- Developing Energy-based Reinforcement Learning algorithms.
- Developing mechanisms for Probabilistic Control.

Borealis AI

Thesis Researcher

2019 - 2021

Toronto, Canada

- Proposed Energy-based MIXer (EMIX) networks for surprise minimization in multi-agent StarCraft II.

- Proposed Evolution-based Soft Actor Critic (ESAC) combining ES and SAC with novel Automatic Mutation Tuning (AMT) for sample-efficient and scalable reinforcement learning.

CMTE, University of Toronto 2019 - 2021
Toronto, Canada
Graduate Research Assistant- Reinforcement Learning

- Developed Hierarchical Reinforcement Learning methods for cooperation and competition with Multi-Agent Learning using CapsNet and ConvNet.
- Improved policy gradient algorithms in conjunction with evolution-based methods.

Signal Processing Lab, Amity University 2017 - 2019
Delhi, India
Undergraduate Research Assistant- Deep Learning

- Proposed novel CapsNets and ConvNets for non-cooperative games in real-time gesture recognition from wearable IMUs
- Proposed Master-Slave Nets for knowledge transfer in hand motion using sEMG sensors.

PUBLICATIONS

- Karush Suri, Xiao Qi Shi, Konstantinos N. Plataniotis, Yuri A. Lawryshyn, “*Energy-based Surprise Minimization for Multi-agent Value Factorization*”, Deep Reinforcement Learning Workshop, 34th Conference on Neural Information Processing Systems (NeurIPS) 2020. ([website](#)) ([arXiv](#))
- Karush Suri, Xiao Qi Shi, Konstantinos N. Plataniotis, Yuri A. Lawryshyn, “*Maximum Mutation Reinforcement Learning for Scalable Control*”, Deep Reinforcement Learning Workshop, 34th Conference on Neural Information Processing Systems (NeurIPS) 2020. ([website](#)) ([arXiv](#))
- Karush Suri, Rinki Gupta, “*Continuous Sign Language Recognition from Wearable IMUs using Deep Capsule Networks and Game Theory*”, Computers And Electrical Engineering, Elsevier, Vol. 78, 2019. ([arXiv](#)) ([code](#))
- Karush Suri, Rinki Gupta, “*Transfer Learning for sEMG-based Hand Gesture Classification using Deep Learning in a Master- Slave Architecture*”, 3rd International Conference on Communication and Computational Intelligence (IC3I) 2018, IEEE. ([arXiv](#)) ([code](#))

INDEPENDENT STUDIES

- Karush Suri, “*On Variational Generalization Bounds for Unsupervised Visual Recognition*”, Report, 2020. ([link](#)) ([code](#))
- Karush Suri, “*On Cooperation in Multi-Agent Reinforcement Learning*”, Report, 2020. ([link](#)) ([code](#))
- Karush Suri, Shashank Saurav, “*Attentive Hierarchical Reinforcement Learning for Stock Order Executions*”, Report, 2020. ([link](#)) ([code](#))

TEACHING ASSISTANTSHIPS

- ECE1512H *Digital Image Processing and Applications*, University of Toronto (Winter 2021)
- CSC104H *Computational Thinking*, University of Toronto (Winter 2021)
- CSC2209H *Computer Networks*, University of Toronto (Fall 2020)
- CSC458H *Computer Networking Systems*, University of Toronto (Fall 2020)
- CSC258H *Computer Organization*, University of Toronto (Winter 2020)
- MATH *Integral Calculus*, Sai Kripa Orphanage (Summer 2016)
- MATH *Numerical Differentiation*, Sai Kripa Orphanage (Summer 2016)
- MATH *Linear Algebra*, Sai Kripa Orphanage (Summer 2016)

INTERNSHIP EXPERIENCE

EdAuthority

Content Management Intern- Data Science

2018-2019

Delhi, India

- Published blog posts on data science concepts and their extensions to the education industry.
- Backend website management and development of scalable solutions for a digital platform.

Airtel

Summer Engineering Intern

2018

Delhi, India

- Project entitled “Fundamentals of Network Communication”.
- Calibrated network interface cards and connectivity sensors for throughput handling.

Reliance Jio

Summer Engineering Intern

2017

Delhi, India

- Project entitled “Excel Data Processing Automator using Python Programming”.
- Automated excel data management for spreadsheet handling and cell-to-cell logging.

Sony

Summer Engineering Intern

2016

Delhi, India

- Project entitled “LCD Television Systems and BRAVIA Engine Applications”.
- Programmed BRAVIA engine cards for video processing and image analysis.

ORGANIZATIONAL WORK & SERVICES

IEEE Signal Processing & Integrated Networks (SPIN)

Lead Organizer

2017-2019

Delhi, India

- Head of the stage team at 6th SPIN.
- Member of the coordinating committee at 5th SPIN.
- Member of the volunteering committee at 4th SPIN.

Signal Processing Lab, Amity University

Lab Assistant

2017-2019

Delhi, India

- Hand motion data collector for lab test subjects.
- sEMG and IMU sensor calibrator for real-time demonstrations.

TECHNICAL SKILLS

Languages- Python, Lua, HTML, C, C++, Assembly, Markdown, MATLAB, L^AT_EX.

Frameworks- PyTorch, Tensorflow, torch7, Numpy, Gym, MuJoCo, Flask, ROS.

Platforms- Amazon Web Services, Google Cloud Platform, Git.