

# Hadi Nekoei Qachkanloo

hnekoeiq.github.io

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226-779-2989

## EDUCATION

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- **University of Waterloo** Waterloo, Canada  
*Master of Applied Science in Electrical and Computer Engineering; GPA: 3.95 (93.5/100)* *Sep. 2017 – Aug. 2019*
  - **Coursework:** Deep Learning, Convex Optimization, Data and Knowledge Modeling and Analysis, Image Processing and Visual Communication
  - **Teaching:** Running tutorials and hands-on labs on Adaptive and Cooperative Algorithms, Probability Theory, and Advanced Numerical Methods for more than 500+ students
  - **Lab Assistant:** Advanced Numerical Methods
- **Sharif University of Technology** Tehran, Iran  
*Bachelor of Engineering in Electronics, Minor in Economics; GPA: 3.75 (17/20)* *Aug. 2012 – July. 2017*

## WORK EXPERIENCE

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- **Montreal Institute of Learning Algorithms (Mila)** Montreal, Canada  
*Researcher* *Jan 2020 - Present*
  - **Model-based RL:** Proposed and evaluated a novel metric (LoCA) for measuring model based behavior of Deep RL algorithms as a collaboration with the Microsoft team at Montreal
  - **Multi-agent RL:** Designed and implemented a testbed for MARL algorithms (DecMARLGrid) with a wide range of challenging scenarios such as zero-shot coordination and continual learning
  - **COVI:** Contributed to running Loopy Belief-Propagation (LBP) inference algorithms on a factor graph for contact-tracing app developed by Mila
  - **Supervisor:** Dr. Sarath Chandar
- **Ciena Corporation** Ottawa, Canada  
*Research Intern* *Sep. 2019 - Dec 2019*
  - **Responsibility:** Designed and implemented an adaptive learning algorithm for the next generation of WaveLogic systems to model and pre-compensate for the nonlinear noise in the fiber-optic systems which improved both performance and complexity of the existing technology, **Manager:** Dr. Maurice Osullivan
- **Coding and Signal Transmission (CST) Lab** Waterloo, Canada  
*Graduate Researcher & Teaching Assistant* *Sep 2017 - Dec 2019*
  - **Thesis:** Adaptive Compensation of Nonlinear Impairments in Fiber-Optic Communication Systems  
**Focus:** Information Theory, Statistical Signal Processing. **Supervisor:** Prof. Amir Khandani
- **Institute for Infocomm Research (I2R), Astar** Singapore, Singapore  
*Research Intern* *Jul 2016 - Sep 2016*
  - **Motion Detection:** Utilized machine learning to design an efficient WLAN connection for a client moving between Access Points with sensor assistance and real-time WLAN data transfer. **Supervisor:** Dr. Chin Keong Ho
  - **Signal Processing:** Designing contactless HR and BR sensing systems to continuously track physiological signals
- **Sharif University of Technology** Tehran, Iran  
*Research Assistant* *Feb 2016 - Aug 2017*
  - **Thesis:** Studied Bluetooth Low Energy connectivity which can be used in low power IoT devices such as ultra-low-power medical devices for long-term monitoring of vital signals, **Advisor:** Dr. Fotowat Ahmady

## PUBLICATION

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- **Under review:** Harm Van Seijen, **Hadi Nekoei**. et al., "The LoCA regret: A Consistent Metric to Evaluate Model-Based Behavior in Reinforcement Learning". Submitted to 34 Conference on Neural Information Processing Systems (NeurIPS), 2020.
- **Accepted:** **NekoeiQachkanloo, H.** et al., Artificial Counselor System For Stock Investment. In Innovative Applications of Artificial Intelligence (IAAI-19) Conference, Honolulu, Hawaii, USA, 2019.: AAAI Press., p. 8.

## PROJECTS

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- **Multi-Agent Reinforcement Learning:** Algorithmic Analysis and Improvements in Multi-Agent Reinforcement Learning in Partially Observable Setting(**Report**) (**Poster**), DLRL summer school 2019, Edmonton
- **Image Classification:** Implementation of Densely Connected Convolutional Networks (DenseNet) on CIFAR100 (**Kaggle**)
- **Time-Series prediction:** Python Implementation of "Autoregressive Tree Model for Time-Series Analysis" (**github**)
- **Sequence Models for Natural Language Processing:** Implementation of RNN and Encoder-decoder models for text classification (**Kaggle**)

## AWARDS AND HONORS

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- Faculty of Engineering Award (FOEs) for outstanding performance among ECE students, 2019
- International Masters Student Award, 2017
- Singapore International Pre-Graduate Award (SIPGA), 2016
- Honored to become a member of National Elite Foundation of Iran, 2012
- Ranked 30<sup>th</sup> among 270,000 participants in the Iran University Entrance Exam, 2012

## PROGRAMMING SKILLS

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- **Expert:** Python, TensorFlow, Keras, Pytorch, Matlab, Azure, Git
- **Familiar:** R, C/C++, Java, Hadoop, Distributed Computing Applications, Ray, HTML

## TALKS

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- **CRL Summer Symposium, May 2020:**  
Do we have to choose between Decentralized Multi-agent Reinforcement Learning and Self-Play?

## REFERENCES

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- **Dr. Sarath Chandar:** Polytechnique Montreal, Mila, sarath.chandar@mila.quebec
- **Prof. Amir Keyvan Khandani:** ECE department, University of Waterloo, khandani@uwaterloo.ca
- **Dr. Mark Crowley:** ECE department, University of Waterloo, mcrowley@uwaterloo.ca
- **Prof. Ali Ghodsi:** David R. Cheriton School of Computer Science, University of Waterloo, ali.ghodsi@uwaterloo.ca
- **Dr. Chin Keong Ho:** Lab Head, Energy-Aware Communications Lab Scientist III Institute for Infocomm Research, A\*STAR, hock@i2r.a-star.edu.sg