

EHSAN GANJIDOOST

PH.D. CANDIDATE IN COMPUTER SCIENCE · WITH SPECIALTY IN DEEP LEARNING & MACHINE LEARNING

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Summary of Qualifications

- Demonstrated **Solid knowledge** and **expertise** in *AI, Deep Learning, Machine Learning*, and *Optimization* through certificates, and doctoral research.
- Acquired analytical and critical thinking abilities through publishing papers, review papers, and grad studies.
- Achieved **3rd rank** in **MMath** in *Computational Mathematics*, and honored with several academic & provincial **awards**.
- Ranked among **top 5** in **MLSP 2014, Kaggle** machine learning challenge on schizophrenia classification.
- Nominated for **NSERC research proposal** by the University of Waterloo in 2017.
- Communicated complex concepts and provided mentorship to students in several courses, either in person or through tutorial sessions, during my Ph.D. program.
- **Volunteered** in a Charity helping families with education and health.

Professional Technical Skills

Advanced Programming	Python, MATLAB, R, C/C++, Java, JavaScript, Node.js, Processing, Gephi, OWL, HTML, LaTeX, Jekyll,
Most Used Packages	Numpy, Scikit-learn, Pandas, PyViz, PyTorch, Tensorflow, Keras, Jax, Matplotlib
Database	SQL, DTD, XML, XSD, XQuery, XSLT, UML, OLAP, JSON, MongoDB
IDE, Editor	PyCharm, IPython, Colab, Sublime, Atom, CodeVisionAVR

Projects & Models (short-listed)

Unsupervised Models	AE, VAE, GAN, Recommender system, Q&A, Machine Translation → main packages: numpy, tensorflow, keras
Supervised Models	CNNs (LeNet, AlexNet, VGGNet, ResNet, Inception) → main packages: numpy, tensorflow, keras
Sequence Models	RNNs (LSTM, GRU), TimeSeries, Word2Vec, debiasing, BiDAF, Transformers, BERT
Projects	fleet scheduling (<i>Cayuga Research</i>), portfolio optimizer (<i>personal project</i>), Predictive Coding (<i>doctoral research</i>)

Relevant Experience

Neurocognitive Computing Lab

DOCTORAL RESEARCHER

Waterloo, ON

Sep. 2016 - present

- Designed & implemented predictive coding platform for generative model experiments.
- Implemented a neural network platform with spiking neurons using Nengo framework for class prediction experiments.
- Developed a neural network based on a real-time dynamical system for research on the compatible biological model.
- Collaborated with fellow researchers on testing symmetric predictive estimator on the Nengo framework.
- Invited to campus Correlation One Datathon working on Uber data from NYC in a team of four, May 2017.

University of Waterloo

GRAD RESEARCHER & DEVELOPER

Waterloo, ON

May. 2014 - Sep. 2016

- Developed a pre-conditioning method for nonlinear optimization solver.
- Implemented a large-scale continuous optimization solver using the coloring method.
- Developed TSP heuristic using edge elimination techniques to find the shortest path among given data points

Education

University of Waterloo

PH.D. IN COMPUTER SCIENCE

Waterloo, Canada

Sep. 2016 - present

- Thesis: Predictive Estimators and Perceptual Feedback Networks

University of Waterloo

MMATH. IN COMPUTATIONAL MATHEMATICS

Waterloo, Canada

Sep. 2014 - Aug. 2015

- Thesis: On Preconditioning the Linearized Conjugate Gradient method for Sparse Nonlinear Optimization.

Iran University of Science & Technology

M.SC. IN COMPUTER ENGINEERING

- Thesis: Study of Cache Structure and its Impact on the Performance of Network Processors

Tehran, Iran

Sep. 2002 - Mar. 2005

Shahid Beheshti University

B.SC. IN COMPUTER ENGINEERING

- Thesis: Wireless Client/server System Implementation

Tehran, Iran

Sep. 1997 - Mar. 2002

Certificates (short-listed)

AI & Machine Learning

Machine Learning, Deep Learning Specialization, NLP Specialization, Tensorflow

Computer Science

Algorithm Design I & II, Intro to Databases, MongoDB

Additional Experience

NAMA co. - startup

CO-FOUNDER & VIDEO EDITOR

- Produced and edited videos for documentaries, a charity, and advertisements.

Tehran, Iran

Jun. 2003 - Sep. 2007

Imam Hadi Charity.

VOLUNTEER VIDEO EDITOR & VIDEOGRAPHER

- Edited and managed video projects using adobe premiere, after effects, and Hollywood fx for producing teaser and video for the charity.

Tehran, Iran

Jun. 2003 - Sep. 2003

Soroush High School.

INSTRUCTOR AND TRAINER

- Taught Fundamental of Computer Programming to prodigy high school students and mentored learners in video editing during the summer school.

Tehran, Iran

Sep. 1997 - Sep. 2003

Select Publications & Presentations

PUBLICATIONS

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|------|--|------------------------|
| 2020 | Ganjidoost E. , "Capturing Variations on Generative Predictive Coding" | <i>pending NeurIPS</i> |
| 2019 | Ganjidoost E. , "On Artificial Neural Networks, Biological Adaptive Neural Networks, Credit Assignment Problem" | <i>under review</i> |
| 2017 | Ganjidoost E. , Orchard J., "Non-linear mapping in a neural network using predictive coding" (research paper) | <i>UofW</i> |
| 2017 | Ganjidoost E. , Orchard J., "Predictive coding framed with neuron engineering framework" (research paper) | <i>UofW</i> |

PRESENTATION

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|-----------|---|---------------------|
| Win. 2020 | "On Predictive Coding", @ Neurocognitive Computing Lab | <i>Waterloo, ON</i> |
| Spr. 2019 | "Generative Neural Networks", @ The 12th Annual Ottawa Mathematics Conference (OMC) | <i>Waterloo, ON</i> |

Awards & Recognitions

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|---------|--|---------------------|
| 2016-20 | Institutional, Academic , Recipient of four Doctoral Awards (total \$30.25k) | <i>Waterloo, ON</i> |
| 2014-15 | Institutional, Academic , Recipient of two Master of Mathematics Awards (total \$9k) | <i>Waterloo, ON</i> |
| 2007 | Provincial, Leadership , Recipient of Tehran City Council Award (Gold prize) | <i>Tehran, Iran</i> |
| 2016-17 | National, Academic , Nominated for NSERC research proposal by the University of Waterloo. | <i>Waterloo, ON</i> |
| 2002 | National, Academic , Ranked Top 0.1% National Entrance Exam for Grad School | <i>Tehran, Iran</i> |
| 1997 | National, Academic , Ranked Top 0.1% National Entrance Exam | <i>Tehran, Iran</i> |
| 1996 | National , Nominated for the 2 nd round of National Computer & Mathematic Olympiad | <i>Tehran, Iran</i> |

Hobbies

Sport Activities

swimming, soccer, ping-pong, biking, and hiking

Usual Habit

listening traditional/country music, watching (documentary/adventure/romance) movies.

To-Do list

photography, astronomy, traveling (specially road trip), driving Race cars