

# 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 **3<sup>rd</sup> 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

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

## Projects & Models (short-listed)

<b>Unsupervised Models</b>	AE, VAE, GAN, Recommender system, Q&A, Machine Translation → main packages: numpy, tensorflow, keras
<b>Supervised Models</b>	<b>CNNs</b> (LeNet, AlexNet, VGGNet, ResNet, Inception) → main packages: nunumpy, tensorflow, keras
<b>Sequence Models</b>	<b>RNNs</b> (LSTM, GRU), TimeSeries, <b>NLPs</b> (Word2Vec, debiasing, BiDAF, Transformers, BERT)
<b>Projects</b>	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

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

### PRESENTATION

- |           |   |                     |
|-----------|---|---------------------|
| 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

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

## Hobbies

**Learning habits** Problem solving (algorithm, optimization, puzzle), brain game

**Sport Activities** swimming, hiking and biking, soccer, ping-pong

**To-Do list** skating, photography, astronomy, coast-2-coast road trip

**Last minute choices** listening to music, watching (documentary/adventure) movies.