

EHSAN GANJIDOOST

COMPUTER SCIENTIST · NEURAL NETWORK & MACHINE LEARNING SCIENTIST

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Education

University of Waterloo

PH.D. IN COMPUTER SCIENCE

- Thesis: Predictive Estimators and Perceptual Feedback Networks

Waterloo, Canada

Sep. 2016 - present

University of Waterloo

MMATH. IN COMPUTATIONAL MATHEMATICS

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

Waterloo, Canada

Sep. 2014 - Aug. 2015

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

Tehran, Iran

Sep. 1997 - Mar. 2002

Certificates (short-listed)

| | |
|---------------------------------|---|
| AI & Machine Learnin | Machine Learning, DeepLearning Specialization, NLP Specialization, Tensorflow |
| Computer Science | Algorithm Design I & II, Intro to Databases, mongoDB |
| Finance | WatRISQ, Corporate Finance, Finance, Financial Accounting |
| Teaching | Fundamentals of University Teaching, Certificate in University Teaching |

Academic Activities

PUBLICATIONS

| | | |
|------|--|-----------------|
| 2020 | Ganjidoost E. , “Capturing Variations on Generative Predictive Coding” | pending NeurIPS |
| 2019 | Ganjidoost E. , “Notes on Neural Networks Part 3: Credit Assignment Problem” | under review |
| 2019 | Ganjidoost E. , “Notes on Neural Networks Part 2: Biological Adaptive Neural Networks” | under review |
| 2019 | Ganjidoost E. , “Notes on Neural Networks Part 1: Artificial Neural Networks” | under review |
| 2017 | Ganjidoost E. , Orchard J., “Non-linear mapping in a neural network using predictive coding” (research paper) | UofW |
| 2017 | Ganjidoost E. , Orchard J., “Predictive coding framed with neuron engineering framework” (research paper) | UofW |
| 2005 | Ganjidoost E. , Akbari A., “Impact of cache structure on network processor performance” (oral) | CESC |
| 2004 | Ganjidoost E. , Gharegouzi A., Akbari A., “Improvement speech quality by noise detection and elimination using averaged algorithm” (research paper) | IUST |
| 2003 | Ganjidoost E. , Fathy M., “Computer Architecture, A Quantitative Aproach - Memory Hierarchy Design” (translation) | IUST |

PRESENTATION

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| Win 2020 | “Pandas’ Essential Tutorial” , @ Neurocomgnitive Computing Lab | Waterloo, ON |
| Win. 2020 | “On Predictive Coding” , @ Neurocomgnitive Computing Lab | Waterloo, ON |
| Spr. 2019 | “Generative Neural Networks” , @ The 12th Annual Ottawa Mathematics Conference (OMC) | Waterloo, ON |
| Apr. 2005 | “Impact of Cache Structure on Network Processor Performance” , @ The 7th Computer Engineering Student Conference (CESC) | Tehran, Iran |
| Apr. 2004 | “Ad-hoc Network Architecture” , @ IUST, Grad Seminar Series | Tehran, Iran |
| Apr. 2003 | “Rollback Recovery Policy in Operating System” , @ IUST, Grad Seminar Series | Tehran, Iran |
| Dec. 2003 | “Computer Networks Performance Modeling” , @ IUST, Grad Seminar Series | Tehran, Iran |

Awards & Recognitions

INSTITUTIONAL, ACADEMIC

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|---------|---|--------------|
| 2016-20 | Receipient , Math Domestic Graduate Student Award (\$20,000) | Waterloo, ON |
| 2017-18 | Receipient , Walter Metzger Memorial Award (\$5,250) | Waterloo, ON |
| 2016-17 | Receipient , University of Waterloo Graduate Scholarship (\$5,000) | Waterloo, ON |
| 2015-20 | Receipient , UW Graduate Research Studentship (\$26,500) | Waterloo, ON |
| 2014-15 | Receipient , UW Math Faculty Graduate Award (\$6,000) | Waterloo, ON |
| 2014-15 | Receipient , UW Mathematics Graduate Experience Award (\$3,000) | Waterloo, ON |

PROVINSIONAL, LEADERSHIP

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| 2007 | Receipient , Tehran City Council Award (Gold prize) | Tehran, Iran |
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NATIONAL, ACADEMIC

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| 2016-17 | Selected , University of Waterloo's NSERC nominee | Waterloo, ON |
| 2002 | Top 0.1% , National Entrance Exam for Grad School | Tehran, Iran |
| 1997 | Top 0.1% , National Entrance Exam | Tehran, Iran |
| 1996 | 2nd round , National Computer & Mathematic Olympiad | Tehran, Iran |

Professional Technical Skills

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| 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 (short-listed)

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| Unsupervised Models | AE, VAE, GAN, Predictive Coding, Recommender system |
| Supervised Models | CNNs (LeNet, AlexNet, VGGNet, ResNet, Inception) |
| Sequence Models | RNNs (LSTM, GRU), Time Series |
| Optimization | fleet scheduling |
| Finance | portfolio optimizer package |

Research Experience

Neurocognitive Computing Lab

GRADUATE RESEARCHER Waterloo, ON

Sep. 2016 - present

- Generative Predictive Coding.
- Portfolio optimizer
- Neural Network Platform with Spiking Neurons.
- Neural Network based on real-time, Dynamical System.

University of Waterloo

RESEARCH ASSISTANT & DEVELOPER Waterloo, ON

May. 2014 - Sep. 2016

- Nonlinear optimization solver.
- Large-scale continuous optimization solver.
- TSP heuristic using edge elimination techniques.

Cayuga Research

RESEARCHER Waterloo, ON

May. 2014 - Sep. 2014

- Logistic & Transportation Allocation.

ITRC

RESEARCH ASSISTANT Tehran, Iran

Mar. 2004 - Mar. 2005

- Network processor architecture.

Educational Activities

University of Waterloo

TEACHING ASSISTANT

CS 486/686: Introduction to AI
CS 475/675: Computational Linear Algebra
CS 489/689: Neural Networks
CS 370: Numerical Computation
CS 240: Data Structure & Data Management
CS 136: Algorithm Design & Data Abstraction
CS 135: Designing Functional Programs

Waterloo, Canada

Sep. 2016 - present

W19, S19, F19, W20, S20

S18

W18

F17, F18

S17

W17

F16

University of Waterloo

TUTORIAL

Math 127: Calculus I for Science
Math 115: Linear Algebra for Engineering
Math 135: Algebra for Honor Math

Waterloo, Canada

Sep. 2014 - May 2015

W15

F14

F14

R&D Experience

Marsuscom co.

COMPUTER ENGINEER

- System & Code Developer.
- Smart Home Control System Developer.

Tehran, Iran

Nov. 2009 - Sep. 2011

PARMAN

TECHNICAL PROGRAMM

- Fiber Optic Network TX/RX STM-1 test and verification engineer.

Tehran, Iran

Jun. 2009 - Nov. 2009

PARSTEL Telecom co.

COMPUTER ENGINEER

- Code Developer for STN-10K Switch.
- Hardware designer and embedded programmer for line card.

Tehran, Iran

Jun. 2007 - Jun. 2009

VESAL co. ISP

COMPUTER ENGINEER INTERN

- Computer Networking.
- Design, Implement and troubleshooting network.

Tehran, Iran

Jun. 2000 - Sep. 2000

Extracurricular Activity

NAMA co. - startup

CO-FOUNDER & VIDEO EDITOR

- Documentary producer, video editor.
- Teaser producer for Advertisement.

Tehran, Iran

Jun. 2003 - Sep. 2007

Imam Hadi Charity.

VOLUNTEER VIDEO EDITOR

- Video production process using special effects, video editing, and producing documentary.

Tehran, Iran

Jun. 2003 - Sep. 2003

Soroush High School.

INSTRUCTOR AND TRAINER

- Teaching Fundamental of Computer Programming.
- Teaching Video Editing in Summer School.

Tehran, Iran

Sep. 1997 - Sep. 2003

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