EHSAN **GANJIDOOST**

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

200 University Ave W, Waterloo, ON N2L 3G1, Canada

(+1) 226-339-7712 | e.ganjidoost@gmail.com | uwaterloo.ca/scholar/eganjido | eganji | ganjidoost | e.ganjidoost | Canadian

Education

University of Waterloo — *Waterloo, Canada*

PH.D. IN COMPUTER SCIENCE — *Sep. 2016 - present*

- Thesis: Predictive Estimators and Perceptual Feedback Networks

University of Waterloo — *Waterloo, Canada*

MMATH. IN COMPUTATIONAL MATHEMATICS — *Sep. 2014 - Aug. 2015*

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

Iran University of Science & Technology — *Tehran, Iran*

M.SC. IN COMPUTER ENGINEERING — *Sep. 2002 - Mar. 2005*

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

Shahid Beheshti University — *Tehran, Iran*

B.SC. IN COMPUTER ENGINEERING — *Sep. 1997 - Mar. 2002*

- Thesis: Wireless Client/server System Implementation

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

Fall 2020	**"Kaggle challenge design"**, @ Intro to Machine Learning Project	*Waterloo, ON*
Fall 2020	**"Transformers"**, @ Neurocomgnitive Computing Lab	*Waterloo, ON*
Spr. 2020	**"Walk through BiDAF model"**, @ Neurocomgnitive Computing Lab	*Waterloo, ON*
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

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

Certificates (short-listed)

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

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: nunmpy, tensorflow, keras
Sequence Models	**RNNs** (LSTM, GRU), TimeSeries, **NLPs** (Word2Vec, debiasing, BiDAF, Transformers, BERT)
Projects	fleet scheduling (*Cayuga Research*), portfolio optimizer (*personal project*), Predictive Coding (*doctoral research*)

Research Experience

Neurocognitive Computing Lab
Waterloo, ON

Doctoral Researcher — *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
Waterloo, ON

Grad Researcher & Developer — *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

Cayuga Research
Waterloo, ON

Researcher — *May. 2014 - Sep. 2014*

- Studied and formulized fleet scheduling for Logistic & Transportation Allocation.

ITRC
Tehran, Iran

Research Assistant — *Mar. 2004 - Mar. 2005*

- Analyzed the cache structure impact on Network Processor performance.

Educational Activities

University of Waterloo — *Waterloo, Canada*

Teaching Assistant — *Sep. 2016 - present*

CS 480/680: Introduction to ML	*F20*
CS 486/686: Introduction to AI	*W19, S19, F19, W20, S20*
CS 475/675: Computational Linear Algebra	*S18*
CS 489/689: Neural Networks	*W18*
CS 370: Numerical Computation	*F17, F18*
CS 240: Data Structure & Data Management	*S17*
CS 136: Algorithm Design & Data Abstraction	*W17*
CS 135: Designing Functional Programs	*F16*

University of Waterloo — *Waterloo, Canada*

Tutorial — *Sep. 2014 - May 2015*

Math 127: Calculus I for Science	*W15*
Math 115: Linear Algebra for Engineering	*F14*
Math 135: Algebra for Honor Math	*F14*

R&D Experience

Marsuscom co. — *Tehran, Iran*

Computer Engineer — *Nov. 2009 - Sep. 2011*

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

PARMAN — *Tehran, Iran*

Technical Programm — *Jun. 2009 - Nov. 2009*

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

PARSTEL Telecom co. — *Tehran, Iran*

Computer Engineer — *Jun. 2007 - Jun. 2009*

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

VESAL co. ISP — *Tehran, Iran*

Computer Engineer Intern — *Jun. 2000 - Sep. 2000*

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

Additional Experience

NAMA co. - startup — *Tehran, Iran*

Co-Founder & Video Editor — *Jun. 2003 - Sep. 2007*

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

Imam Hadi Charity. — *Tehran, Iran*

Volunteer Video Editor & Videographer — *Jun. 2003 - Sep. 2003*

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

Soroush High School. — *Tehran, Iran*

Instructor and Trainer — *Sep. 1997 - Sep. 2003*

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

Hobbies

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