AMIRHOSSEIN DABIRIAGHDAM

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EDUCATION

University Of British Columbia *Sep. 2023 - Present*
- M.A.Sc. in Electrical and Computer Engineering

University Of Tehran *Sep. 2018 - Jul. 2023*
- B.Sc. in Electrical Engineering *Cumulative GPA:* **19.21/20**

  Thesis: "An Analysis of Forgettable Examples Extracted During Multilingual Models Training"
- Minor in Computer Engineering *Cumulative GPA: 18.82/20*

Allameh Helli Tehran High School *Sep. 2014 - Jun. 2018*
- Diploma in Mathematics and Physics' Discipline *Cumulative GPA: 19.95/20*

Affiliated with the National Organization for the Development of Exceptional Talents (NODET)

RESEARCH INTERESTS

- Graph Neural Networks
- Machine Learning & Deep Learning
- Natural Language Processing
- Information Theory

HONORS & AWARDS

- Ranked 2nd among 120 B.Sc. students in Electrical Engineering, University of Tehran. *2022*
- Ranked 1st among Control Engineering B.Sc. Students, University of Tehran. *2022*
- Ranked 537th among about 150,000 participants in the Nationwide University Entrance Exam. *2018*
- Winner of FOE Award (Faculty of Engineering Award for top students). *2019*
- Recognized as a talented student in the entrance exam of NODET for high school. *2014 - 2018*
- Kyokushin Karate Black Belt holder and member of IKO Kyokushinkaikan. *2008 - Present*

PUBLICATION

- Targeted Adversarial Attacks against Neural Machine Translation
  Sahar Sadrizadeh, **AmirHossein DabiriAghdam***, Ljiljana Dolamic, Pascal Frossard*
  IEEE ICASSP, Rhodes Island, Greece, June 2023.

RESEARCH EXPERIENCE

Graduate Research Assistantship *Sep. 2023 - Present*
ECE department, University of British Columbia *Vancouver, Canada*
- Working on employing graph neural networks (GNNs) for anomaly-based advanced persistent threats detection using provenance graphs of network hosts.
- Under the supervision of Prof. Wang

Research Internship - EPFL Excellence in Engineering (E3) *Jul. 2022 - Sep. 2022*
Signal Processing Laboratory 4 (LTS4), EPFL *Lausanne, Switzerland*
- Worked on the targeted adversarial attacks against transformer-based neural machine translation (resulted in the publication above).
- Under the supervision of Prof. Frossard

Research Assistantship *Sep. 2022 - Jul. 2023*
ECE department, University of Tehran *Tehran, Iran*
- Worked on analyzing the effect of forgettable examples training on the out-of-distribution generalization of multilingual models in single- and multi-source training (for my bachelor's thesis).
- Under the supervision of Prof. Yaghoobzadeh

TEACHING EXPERIENCE

Teaching assistant , *University of Tehran, ECE department*

- **Engineering Probability & Statistics**
  Instructor: Dr. B. Bahrak *Fall 2022*
- **Signals and Systems**
  Instructor: Dr. S. Akhavan Behabadi *Spring 2022*
- **Introduction to Computing Systems & Programming**
  Instructor: Dr. M. Moradisabzevar *Fall 2019*

RELEVANT COURSES (Graduate courses are indicated by †)

- **Machine Learning† (92/100)**
  Instructors: Dr. M. Schmidt & Dr. J. Clune
- **Deep Learning with Structures† (93/100)**
  Instructor: Dr. R. Liao
- **Reinforcement Learning† (20/20)**
  Instructor: Dr. M. Nili Ahmad Abadi
- **Linear Algebra (20/20)**
  Instructor: Dr. M. J. Yazdanpanah
- **Mechatronics Engineering (20/20)**
  Instructor: Dr. M. Tale Masouleh
- **Data Structures (19.7/20)**
  Instructor: Dr. R. Shojaee
- **Information and Coding Theory† (94/100)**
  Instructor: Dr. C. Leung
- **Natural Language Processing† (20/20)**
  Instructors: Dr. Y. Yaghoobzadeh & Dr. H. Faili
- **Engineering Probability & Statistics (19.5/20)**
  Instructor: Dr. A. M. Rabiei
- **Artificial Intelligence (20/20)**
  Instructors: Dr. H. Fadaei & Dr. M. Moradi
- **Advanced Programming (20/20)**
  Instructor: Dr. R. Khosravi
- **Algorithm Design (19.1/20)**
  Instructor: Dr. M. Asadpour

SELECTED COURSE PROJECTS

Machine Learning [Grad. course]

- Working on the multi-modal classification of types of persuasion in internet memes using state-of-the-art vision-language models such as LLaVA and BLIP-2 (a work in progress).

Deep Learning with Structures [Grad. course]

- Working on the identification of colorectal polyp subtypes on whole slide images using GNNs (a work in progress).

Natural Language Processing [Grad. course]

- Implementing renowned text Tokenizers (such as BPE) from scratch.
- Spam detection by implementing Naïve Bayes from scratch.
- Part-of-Speech tagging and Name Entity Recognition using LSTM/GRU and Viterbi Algorithm.
- Textual Entailment task using Mono- and Multi-Lingual Transformers such as XLM-RoBERTa.
- Deploying a Neural Machine Translation System using tools such as OpenNMT and FairSeq.
- Question Answering task using Transformers such as PersianBERT on three Persian datasets.

Reinforcement Learning [Grad. course]

- Implementing Epsilon-Greedy, Upper-Confidence-Bound, and Gradient-Bandit algorithms for a Multi-armed Bandit problem.
- Implementing Policy and Value Iteration algorithms (for FrozenLake environment of gym library).
- Implementing Q-learning, SARSA, Tree Backup n-Step, On-policy Monte Carlo (for Taxi environment of gym library).
- Implementing Deep Q-learning from scratch using PyTorch (for Highway environment of gym library).
- Fine-tuning GPT2 language model for comment generation with positive/negative sentiment using Proximal Policy Optimization RL algorithm.

Artificial Intelligence

- Detecting COVID-19 & PNEUMONIA in X-ray scans by training a Feed Forward Neural Network implemented using Keras.
- Implementing a Feed Forward Neural Network from scratch and training it on Fashion MNIST Dataset.

- Sentiment Analysis of Digikala Comments Dataset using Naïve Bayes Classifier implemented from scratch.
- Exploratory dataset analysis and implementation of some ML algorithms for Kaggle House Prices competition.
- Finding combinations of gates (AND/OR/XOR) to satisfy the truth table using genetic algorithm.
- Implementing the snake game using informed (A*) and uninformed (BFS, IDS) search algorithms.

Mechatronics Engineering

- Arranging colored blocks in the production line based on machine vision (OpenCV) using UR10 pick & place robot; simulated in CoppeliaSim and controlled by MATLAB robotics toolbox.
- A two-link robotic arm control via PID by calculating inverse kinematics (simulated in MATLAB Simulink).
- Face, eyes & mouth recognition with cascade classifier using OpenCV.

SKILLS

Programming	Python, C/C++, MATLAB, Verilog, Visual Basic ML/AI libraries: Huggingface Transformers, PyTorch, Tensorflow, Keras, NumPy, Pandas, scikit-learn, OpenCV Familiar with LaTeX, C#, JAVA, PHP, SQL, JS, Assembly
Engineering & Simulation Software	MATLAB Simulink®, ModelSim, Quartus, Proteus, CoppeliaSim, ROS, Gazebo
Technology	MQTT, Git, MakeFile Familiar with ARM (STM32), AVR, Arduino, ESP32
Operating Systems	Microsoft Windows, Linux (Ubuntu)

LANGUAGES

Persian	Native (Bilingual Proficiency)
Turkish (Azari)	Native (Bilingual Proficiency)
English	Proficient - **IELTS (10 Nov. 2022): Overall 8 (R:9, L:9, S:7, W:7)**

REFERENCES

Available upon request.