Fateme Sadat Haghpanah

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Education

- **M.Sc. in Computer Science, University of Toronto** Jan. 2021 – May 2023
  Select Courses: Natural Language Processing and Computing (A-), Topics in Machine Learning for Health (A), Topics in Computational Social Science (A), Machine Learning (A+). GPA: 4.00/4
- **M.Sc. in Biomedical Engineering, Columbia University** Sept. 2018 – Dec. 2019
  Select Courses: Applied Data Science (A), Empirical Methods of Data Science (A), Applied Deep Learning in Biomedical (A+).
- **B.Sc. in Computer Engineering, Sharif University of Technology** Sept. 2013 – Jan. 2018
  Select Courses: Signal and Systems, Probability and Statistics for Computer Engineering, Data Structures and Algorithms, Discrete Structures, Advanced Programming.

Professional Experience

- **Research Assistant at University of Toronto - (Toronto, Canada)** Jan. 2021 – May 2023
  Affiliated with "*Vector Institute for Artificial Intelligence*," "*University Health Network*," and "*SickKids, the Hospital for Children*."
  - Designed and developed the first-ever neural network-based pipeline to detect cerebral microbleeds (CMB) in preterm infants' brain MRI scans.
  - Developed a supervised convolutional neural network model to expedite the diagnosis of brain tumors in children within hospital emergency rooms with the AUC ROC score of 0.95.
  - Frameworks: PyTorch, Sci-kit Learn, Pandas, OpenCV.
- **Research Assistant at Columbia University - (NY, USA)** Sept. 2018 – Sept. 2020
  - Implemented a U-Net-based segmentation model to accurately distinguish between 9 different tissues and 78 distinct regions of the neonatal brain's MRI
  - Designed a novel segmentation algorithm to identify 6 various tissues of whole-body MRI scan to enhance MRI safety.
  - Frameworks: PyTorch, Sci-kit Learn, Pandas, OpenCV.
- **Data Scientist at Divar, Classified-Ad Platform - (Tehran, Iran)** Sept. 2017 – Aug. 2018
  - Developed an innovative search algorithm utilizing semantic networks and word embedding to enhance search result relevancy, improving the user experience.
  - Leveraged behavioral pattern analysis to refine user queries and optimize search filters across categories, enhancing the overall search experience.
  - Developed a machine learning image search algorithm using CNNs to assist human reviewers in identifying and removing duplicate listings from the platform.
  - Framework: Python, PySpark, fastText, Apache Zeppelin, SQL, Airflow.

Select Skills

- **Programming Languages** : Python, C/C++, MATLAB, SQL.
- **Tools and Frameworks** : PyTorch, Tensorflow, Sci-kit Learn, Numpy, Pandas, Jupyter, OpenCV, PySpark, Git, Apache Spark, Apache Zeppelin, Apache Airflow, Tableau.
- **Languages** : Persian (Native), English (Fluent), Spanish (Beginner).

Honors and Awards

- **CRA-WP Scholarship** to attend CRA-WP Grad Cohort Workshop for Women. April 2022 and 2023
- **Vector Institute for Artificial Intelligence Research Grant** 2021 and 2022
- **Temerty Innovation Grant for AI in Medicine** 2021
  Won a research grant of 200K from T-CAIREM as one of the three winners for the proposal titled "Machine Learning-Based Innovation in Ocular Pediatric Assessment Using Point of Care Ultrasound."
- **Bronze Medal** in 8th Iranian National Olympiad of Astronomy & Astrophysics (INOA). 2012

Select Projects

◇ **Neural Machine Translation - Course Project at University of Toronto** Jan. 2023 – Apr. 2023

· Implemented an encoder-decoder model with both single and multi-head attention mechanism to translate English to French using the Hansards dataset.

◇ **Causality in Medical Imaging - Course Project at University of Toronto** Sept. 2022 – Dec. 2022

· Investigated the impact of causality on medical imaging by utilizing supervised machine learning algorithms to detect MRI acquisition parameters using the PPMI dataset, aiming to assess the potential improvement in performance.

◇ **Face Emotion Recognition - Course Project at Columbia Univesity** Sept. 2019 – Dec. 2019

· Created a facial emotion recognition classifier using feature extraction and selection techniques like HOG, SIFT, PCA, and landmark detection. Trained different classification models, including LDA, SVC, RandomForest, MLP, KNN, AdaBoost, and CNN-based approaches.

Publications

◇ Yun Wang*, Fateme Sadat Haghpanah*, Xuzhe Zhang, Katie Santamaria, Gabriela Koch da Costa Aguiar Alves, Elizabeth Bruno, Natalie Aw et al. **ID-Seg: an infant deep learning-based segmentation framework to improve limbic structure estimates.** Brain Informatics 9, no. 1 (2022): 12.

◇ Xuzhe Zhang, Elsa D. Angelini, Fateme S. Haghpanah, Andrew F. Laine, Yanping Sun, Grant T. Hiura, Stephen M. Dashnaw et al. **Quantification of lung ventilation defects on hyperpolarized MRI: The Multi-Ethnic Study of Atherosclerosis (MESA) COPD study.** Magnetic Resonance Imaging 92 (2022): 140-149.

◇ Yun Wang*, Fateme Sadat Haghpanah*, Natalie Aw, Andrew Laine, and Jonathan Posner. **A transfer-learning approach for first-year developmental infant brain segmentation using deep neural networks.** bioRxiv (2020): 7.

Additional Experience

◇ **Teaching Assistant - University of Toronto, Columbia, and Sharif** Sept. 2014 – 2023

· Hold tutorial and office hour sessions for 40+ students.

· Invigilate and grade exams; Prepare and grade assignments.

· Select Courses: Machine Learning, Intro to Computer Programming, Advanced Programming

◇ **Graduate Application Assistance Program (GAAP) - University of Toronto** Fall 2021 and 2022

· Co-organize a volunteer-led group of graduate students that aims to ensure underrepresented students around the globe receive feedback on a draft of their grad-school application.

◇ **Student Scientific Chapter (SSC) - Sharif University of Technology** May 2015 – May 2017

· Elected for two consecutive years among 30+ candidates to be a member of the Computer Engineering Department's student committee, including nine members, concerned with extra-curricular events.

· Select Skills: Leadership, Communication, Problem-Solving, Teamwork

◇ **Winter Seminar Series (WSS) - Sharif University of Technology** Dec. 2015 and 2016

· Co-established WSS as a premier event at Sharif University, focusing on building a professional community and providing a platform for networking and knowledge exchange in computer science and engineering.