Marzie Saghayi

Data Scientist

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Website: https://saghayi.github.io/ Location: Montreal, CA

Employment History

Data Scientist ***(August 2019 – Present)***
Institute for Big Data Analytics *@ Dalhousie University, Halifax, NS, CA*

- Research, customization, and development of statistical and machine learning algorithms
- Analysis of big data for data-driven solution validation, evaluation, and technology innovation
- Editing and preparing manuscripts for publications and presentations
- Preparing reports and presenting findings to the scientific community
- Developing models and theories to address issues in the field

Data Scientist ***(March 2020_June2020)***
Cognitive Health and Recovery Research Lab *@ Dalhousie University, Halifax, NS, CA*

- Clinical data integration and visualization
- Investigating post-operative cognitive dysfunction in elderly patients
- Analyzing surgical time series (anesthesia depth, patients' vitals, …)

Research Assistant ***(January 2019 – August 2019)***
Nova Scotia Health Authority (NSHA) *@ QEII Health Sciences Centre, Halifax, NS, CA*

- Administering, scoring, and recording results for study tests (e.g. questionnaires)
- Collecting fMRI and MRI data related to study
- Filing study documents, test results, etc.
- Developing and maintaining methods of tracking information through databases and spreadsheets

Research Assistant ***(July 2017 – July 2019)***
Brain Networks and Neurophysiology Laboratory (Netphys) *@ Dalhousie University, Halifax, NS, CA*

- Analysis of brain imaging data and publishing theoretical and scientific investigations
- Participating in data collection
- Biomarker development with machine learning techniques
- Development of new analytic tools for improving disease diagnosis for neuropsychiatric conditions
- Helping with organizational and administrative duties
- Preparing required documentation for grants and scholarships

Volunteer Research Assistant ***(March 2017– June 2017)***
Biomedical Translational Imaging Centre (BIOTIC) *@ IWK Health Centre, Halifax, NS, CA*

- Postprocessing PET and MRI data

Computer Programmer ***(April 2015– April 2016)***
Milad RayanehShahrekord *@ Shahrekord, Iran*

- Programing in C and HTML
- Debugging, maintenance and test deployed programs
- Collaborating with product, design, and marketing teams
- Preparing user manuals and guidelines

Lab Assistant ***(September 2014– December 2014)***
Physics, Faculty of Science *@ University of Guilan, Rasht, Iran*

- General Physics 1

Teacher Assistant ***(September 2013– April 2014)***
Physics, Faculty of Science *@ University of Guilan, Rasht, Iran*

- General Physics 1
- Optics

Research Interests

Self-supervised learning, Visual analytics, Constrained optimization, Federated learning¸ Few-shot learning

Education

DLRL Summer School (July 2021–July 2021)
Mila - Quebec Artificial Intelligence Institute, Montreal, Canada

McMedHacks Summer School (June 2021–July 2021)
Deep Learning and Medical Image Analysis @ McGill University, Montreal, Canada

Graduate Studies Program (September 2020 – April 2021)
Computer Science @ Dalhousie University, Halifax, Canada

Master of Science in Physics (September 2012 – February 2015)
Research on Medical Imaging Devices @ University of Guilan, Rasht, Iran

Bachelor of Science in Physics (September 2008 – July 2012)
@ University of Guilan, Rasht, Iran

Patent

*Varno, Farshid, Behrouz Haji Soleimani, **Marzie Saghayi**, Lisa Di Jorio, and Stan Matwin. "Method and System for initializing a neural network". us WO2020225772A1, 2020.*

Publication

Conference Articles:

*Varno, Farshid, **Marzie Saghayi,** Laya Rafiee, Sharut Gupta, Stan Matwin, Mohammad Havaei. "AdaBest: Minimizing Client Drift in Federated Learning via Adaptive Bias Estimation". Submitted at ECCV 2022*

Journal Articles:

***Saghayi, Marzie**; Jonathan Greenberg, Christopher O'Grady, Farshid Varno, Muhammad A Hashmi, Bethany Bracken, Stan Matwin, Sara W Lazar, Javeria Ali Hashmi. "Brain network topology predicts participant adherence to mental training programs". Network Neuroscience Journal, 2020.*

*Varno, Farshid, Behrouz Haji Soleimani, **Marzie Saghayi**, Lisa Di Jorio, and Stan Matwin. "Efficient neural task adaptation by maximum entropy initialization." arXiv preprint arXiv:190.*

Working Papers:

***Saghayi, Marzie**; Lynn Lethbridge, JoAnne Douglas, Elaine Marsh, Michael Dunbar, Stan Matwin. "A Deep Insight into Hospital acute Length of Stay after Hip or Knee Arthroplasty, a Case Study on Operations in Nova Scotia, Canada".*

Conference Publications:

Oral Presentations: ***Saghayi, Marzie**; Lynn Lethbridge, JoAnne Douglas, Elaine Marsh, Michael Dunbar, Stan Matwin. "Predicting Hospital acute Length Of Stay (LOS), after having Hip or Knee surgery based on data from five hospitals in Nova Scotia." Surgery Research Day 2021 at Dalhousie University, Annual meeting; Halifax, Nova Scotia, Canada.*

Poster Presentations:

***Saghayi, Marzie**; Lynn Lethbridge, JoAnne Douglas, Elaine Marsh, Michael Dunbar, Stan Matwin. "Examining the Association between Surgical Wait Times and Hospital Length of Stay Using Machine Learning Algorithms." Surgery Research Day 2020 at Dalhousie University, Annual meeting; Halifax, Nova Scotia, Canada.*

***Saghayi, Marzie**; Farshid Varno, Stan Matwin, Muhammad Hashmi, Jonathan Greenberg, Sara Lazar, Javeria Hashmi. "A machine learning strategy for using rs-fMRI to predict study adherence in a mental training trial. " 2019 OHBM (Organization of Human Brain Mapping) Annual meeting; Rome, Italy.*

***Saghayi, Marzie**; Farshid Varno, Stan Matwin, Jonathan Greenberg, Sara W Lazar, Javeria Ali Hashmi. "Resting brain connectivity states predict participant adherence to mental training programs." Poster presented at: Fifth Anniversary of the Institute for Big Data Analytics at Dalhousie University; 2018 November 23; Halifax, Nova Scotia, Canada.*

***Saghayi, Marzie**; Jonathan Greenberg, Karim Mukhida, Stan Matwin, Sara Lazar, Javeria Ali Hashmi. "Brain connectivity states predict participant engagement in web-based behavioral training." Poster presented at: 2018 OHBM (Organization of Human Brain Mapping) Annual meeting; Singapore.*

***Saghayi, Marzie**; Jonathan Greenberg, Karim Mukhida, Stan Matwin, Sara Lazar, Javeria Ali Hashmi. "Brain network clustering predicts the predisposition to engage in online mental training programs." Poster presented at: Anesthesia Research Day at Dalhousie University; 2018 April 13; Halifax, Nova Scotia, Canada.*

***Saghayi, Marzie**; Jonathan Greenberg, Karim Mukhida, Stan Matwin, Sara Lazar, Javeria Ali Hashmi. "Brain network clustering predicts the predisposition to engage in online mental training programs." Poster presented at: Dal pain research day at Dalhousie University; 2018 May 8; Halifax, Nova Scotia, Canada.*

Technical Skills

Machine Learning Design Frameworks: ***Pytorch, Scikit-learn***

Machine Learning Lifecycle Frameworks: ***Polyaxon, MLflow***

Python Package Fluency: ***NumPy, SciPy, Pandas***

Programming Languages: ***Python, Java, SQL, Bash***

Data visualization tools: ***Tableau, TensorBoard***

Cloud Environments: ***AWS***, ***Google cloud***

Statistical Analysis Tools: ***IBM's SPSS***

Medical Imaging Tools: ***AFNI, FSL, FreeSurfer***

Version control: ***Git, GitHub***

Working Platforms: ***Linux, Mac OS, Windows***

Credentials

Certificate for completing "ICH-GCP Training for Investigators & Research Team Members & Part C Division 5 Regulations", Nova Scotia Health Authority (NSHA).

Certificate for completing "TCPS 2: CORE (Course on Research Ethics)", PANEL ON RESEARCH ETHICS (Navigating the ethics of human research)

Workshop on Pattern Recognition in Neuroimaging, National University of Singapore

Honors

Nova Scotia University Student Bursary award (2020-2021)

Co-Organizing annual **Dal Pain Research Day** Seminar, Dalhousie University, 2019.

3rd Rank in Bachelor of Science (among 36 students in class of 2008)

Granted exemption from Iranian universities entrance exam for Masters, based on **Recognition for Brilliant Talents**

Consistent record of high academic achievement: merit **scholarships awarded** every semester from Ministry of Science and Higher Education of Iran during MSc ad BSc degrees.

Selected to participate the **Iranian Physics Olympiads Competition** as the representative of University of Guilan.

Selected to participate the 8th Annual Laboratory Competition for Iranian High Schools/Physics.