# Farshid Varno

Montreal, QC, Canada

## Experience

**Imagia** — **Montreal, Canada**
*Research Scientist* — May 2018–present
- Member of Open Innovation team.
- Research on *Federated Learning* Optimization led to SOTA performance via drift elimination.
- Research on Transfer Learning led to a filed patent.
- Research on multiple Meta Learning and Few-shot Learning projects.
- Research on Multi-hypothesis Transfer Learning and out of distribution generalization.
- Collaborated with R&D team in designing an AI library for Imagia research.
- Collaborated with IT in porting Polyaxon on a cluster of NVIDIA DGX systems.

**Institute for Big Data Analytics** — **Halifax, Canada**
*Research Assistant* — May 2017–May 2018
- Research on predicting human behaviour from *fMRI* data.
- Developing a *CNN* framework for detecting corrosion in aircrafts using *D-Sight* technology (*DAIS*).
- Optimizing calculation of minimum distance to shore from *AIS-GIS* streaming data using *CUDA* and *OpenMP*.
- Research on sparsity, activation functions and normalization.

**Cognitive Health and Recovery Research Lab** — **Halifax, Canada**
*Data Scientist (part-time)* — Mar 2020–Jun 2020
- Clinical data integration and visualization.
- Investigating post-operative cognitive dysfunction in elderly patients.
- Analyzing surgical time series data (anesthesia depth, patients' vitals, ...).

**Kara Telephone** — **Tehran, Iran**
*FPGA Engineer* — Jun 2013–Jun 2014
- Design & Imp. of TDM switches on FPGAs supporting up to 16k×16k channels (in VHDL)
- Multi-channel I2C master controller supporting 16 modules with error checking & correction.
- SPI & USART Peripheral interfaces.

**Sarvnet Tele. Inc.** — **Isfahan, Iran**
*FPGA Engineer Intern* — Jun 2012–May 2013
- Design & imp. of lightweight AES encryption modules for Virtex 4 & 6 Xilinx FPGA series.

## Teaching

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| **Dalhousie University, Halifax, Canada** | | |
| – *ML for Big Data, CSCI-6515* | Co-instructor | Fall 2020 |
| – *ML for Big Data, CSCI-6515* | TA | Fall 2018 |
| – *Digital Circuits, ECED-2200* | TA | Winter 2017 |
| – *System Analysis, ECED-3401* | TA | Fall 2017 |
| **Chehelsotoon Inst. for Higher Edu., Isfahan, Iran** | | |
| – *Computer Architecture* | Instructor | Fall 2015 |
| – *System Programming* | Instructor | Fall 2015 |
| **University of Guilan, Rasht, Iran** | | |
| – *Introduction to Java* | TA | Winter 2009 |
| – *Introduction to Algorithms* | TA | Winter 2010 |

## Education

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| **Dalhousie University, Halifax, Canada** | *P.hD. in Computer Science*, CGPA: 4.19 | 2017–present |
| **Mila, Montreal, Canada** | *DLRL Summer School* | 2020 |
| **University of Isfahan, Isfahan, Iran** | *M.Sc. in Computer Architecture*, CGPA: 4.01 | 2012–2015 |
| **University of Guilan, Rash, Iran** | *B.Sc. in Computer Engineering* | 2008–2012 |

## Top Skills

**Programming languages (ordered by current freq. of usage)**: Python, Java, C/C++, Bash
**Deep learning libraries (ordered by current freq. of usage)**: Pytorch, Tensorflow, Theano
**MLOps, automation & AI scaling systems**: Polyaxon, MLflow
**Machine learning libraries**: Pandas, scikit-learn, Numpy, Scipy
**Markup languages**:LaTeX, Markdown, Mermaid

## Publication

- ❖ Farshid Varno, Laya Rafiee, Sharut Gupta, , Marzie Saghayi, Stan Matwin, and Mohjammad Havaei. Eliminating client drift in federated learning via adaptive bias estimation. In *review stage at ICML*, 2022
- ❖ Farshid Varno, Lucas May Petry, Lisa Di Jorio, and Stan Matwin. Learn faster and forget slower via fast and stable task adaptation. *arXiv preprint arXiv:2007.01388*, 2020
- ❖ Farshid Varno, Behrouz Haji Soleimani, Marzie Saghayi, Lisa Di Jorio, and Stan Matwin. Efficient neural task adaptation by maximum entropy initialization. *arXiv preprint arXiv:1905.10698*, 2019
- ❖ Xiang Jiang, Mohammad Havaei, Farshid Varno, Gabriel Chartrand, Nicolas Chapados, and Stan Matwin. Learning to learn with conditional class dependencies. In *international conference on learning representations*, 2018
- ❖ Marzie Saghayi, Jonathan Greenberg, Christopher O'Grady, Farshid Varno, Muhammad Ali Hashmi, Bethany Bracken, Stan Matwin, Sara W Lazar, and Javeria Ali Hashmi. Brain network topology predicts participant adherence to mental training programs. *Network Neuroscience*, 4(3):528–555, 2020

## Patent

- ❖ Farsheed Varno, Behrouz Haji Soleimani, Marzie Saghayi, Lisa Di Jorio, and Stan Matwin. Method and system for initializing a neural network. `https://patents.google.com/patent/WO2020225772A1`, Nov 2020

## Awards & Recognition

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| Accelerate Award, 56k CAD | Mitacs | 2021-2022 |
| Scotia Scholar Award, 45k CAD | Research Nova Scotia | 2019-2021 |
| Best Graduate Student Research Award | Big Data Congress | Sep 2017 |
| Nova Scotia University Student Bursary | Government of Nova Scotia | 2020-2022 |
| FGS's alloc. for outstanding status, 2k CAD | Dalhousie University | Aug 2017 |
| First Rank Student Recognition | University of Isfahan | Mar 2015 |

## Other Highlights

- Vice-president of Public Relations, Toastmasters International, Dal Toastmasters, 2020.
- Have led teams of 2-3 researchers during several projects.
- Mentored two masters students both working as Data Scientists, one of which promoted to senior level recently.
- Conference Program Committee Member/Volunteer: ICLR2020, KDD2017.
- Grantee of 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 MS.c. ad BS.c. degrees.
- Accomplished to participate at the Iranian Computer Olympiads Competition as the representative of University of Guilan.