Farshid Varno

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Intro

I am an AI Researcher, Engineer and Entrepreneur with a strong technical background and a thirst for building new technologies. I'm a Team player who strives to communicate, share, and achieve as a group. In summary:

- Founder of Varnio Technologies
- Main contributor of FedSim Simulator
- Research Assistant at Institute for Big Data Analytics.
- Doctoral Candidate at Dalhousie University

Experience

Research & Industry

Research Assistant, Institute for Big Data Analytics
March 2022 - present, Halifax, Canada

- Research project: Jeebs Effect, Preserving Privacy in Multi-Task Federated Learning.
- Research project: Closing the Gap Between Federated and Centralized Learning.

Founder, Varnio Technologies
July 2022 - present, Montreal, Canada

- Design and Development of FedSim, a Generic Federated Learning Simulator.

Research Scientist, Imagia
May 2018–March 2022, Montreal, Canada

- 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.

Research Assistant, Institute for Big Data Analytics
May 2017–May 2018, Halifax, Canada

- 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.

Data Scientist (part-time), Cognitive Health and Recovery Research Lab
Mar 2020–Jun 2020, Halifax, Canada

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

FPGA Engineer, Kara Telephone
Jun 2013–Jun 2014, Tehran, Iran

- Design & Imp. of TDM switches on FPGAs supporting up to 16k x 16k channels (in VHDL)
- Multi-channel I2C master controller supporting 16 modules with error checking & correction.
- SPI & USART Peripheral interfaces.

Teaching

Role	Course	Intitution	Semester(s)
Co-instructor	ML for Big Data, CSCI-6515	Dalhousie University	Fall 2020
Teacher Assistant	ML for Big Data, CSCI-6515	Dalhousie University	Fall 2018
Teacher Assistant	Digital Circuits, ECED-2200	Dalhousie University	Winter 2018
Teacher Assistant	System Analysis, ECED-3401	Dalhousie University	Fall 2017
Instructor	Computer Architecture	Chehelsotoon Inst. for Higher Edu	Fall 2015
Instructor	System Programming	Chehelsotoon Inst. for Higher Edu	Fall 2015
Teacher Assistant	Java Programming	University of Guilan	Winter 2009
Teacher Assistant	Algorithms	University of Guilan	Winter 2010

Background

Education

- Ph.D., Computer Science. Dalhousie University. 2017–present, CGPA: 4.19
- M.Sc., Computer Architecture. University of Isfahan. 2012–2015, CGPA: 4.02
- B.Sc., Guilan University. 2008–2012.

Skills

- Programming languages: **Python**, Java, C/C++, Bash
- Deep learning frameworks: **PyTorch**, Keras, Tensorflow
- CI/CD platform: **Github Actions**
- MLOps, automation & AI scaling systems: **Polyaxon**, **MLflow**
- Machine learning libraries: Pandas, Scikit-learn, Numpy, Scipy
- Markup languages: LaTeX, Markdown, RestructuredText, Mermaid
- Project Management tools: Jira, YouTrack

Publications

Papers

- Varno, Farshid, Marzie Saghayi, Laya Rafiee, Sharut Gupta, Stan Matwin, and Mohammad Havaei. "Minimizing Client Drift in Federated Learning via Adaptive Bias Estimation." *European Conference on Computer Vision.* – **ECCV** (2022).
- Varno, Farshid, 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).
- Varno, Farshid, 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).
- Jiang, Xiang, Mohammad Havaei, Farshid Varno, Gabriel Chartrand, Nicolas Chapados, and Stan Matwin. "Learning to learn with conditional class dependencies." In *international conference on learning representations.* – **ICLR** 2018.
- Saghayi, Marzie, 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, no. 3 (2020): 528-555.

Patent

- Varno, Farsheed, 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. _ EP WO CA CN_ (2020)

Honors

Leadership & Volunter Work

- Vice-president of Public Relations, Toastmasters International, Dal Toastmasters, 2020.
- Experienced leading teams of 2-3 researchers during several projects.
- Mentored two masters students, now working as Senior Data Scientists in USA & Brazil.
- Reviewer at European Conference on Computer Vision (**ECCV 2022**).
- Conference Program Committee Member & Volunteer
  - International Conference on Learning Representations (ICLR 2020)
  - SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 2017).

Awards & Recognition

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