Hossein Sharifi-Noghabi

Machine learning researcher/ Bioinformatics researcher

Email: hsharifi@sfu.ca/ Website: https://hosseinshn.github.io/

Research interests

Deep transfer learning, domain generalization, unsupervised and semi-supervised domain adaptation, adversarial learning, meta-learning, applications in pharmacogenomics and healthcare.

Education

Ph.D. in Computer Science (GPA: 4.08) **Sep 2016-Present**

Simon Fraser University, Burnaby, BC, Canada.

- Supervisors: Prof. Martin Ester and Prof. Colin Collins
- Awards: Computing Science Graduate Fellowship ($6,500, $7,400, and $8,000)
- Teaching Assistant: Introduction to computer programming I (Python)

M.Sc. in Artificial Intelligence (GPA: 17.05/20) **Sep 2012-Feb 2015**

Ferdowsi University of Mashhad, Mashhad, Iran.

- Supervisor: Prof. H. Rajabi Mashhadi

B.E. in Information Technology (GPA: 17.92/20) **Sep 2008-July 2012**

Sadjad University of Technology, Mashhad, Iran.

- Honor: Ranked 1st among 67 students of Information Technology

Selected publications

H. Sharifi-Noghabi, S. Peng, O, Zolotareva, C. Collins, M. Ester. (2020), "AITL: Adversarial Inductive Transfer Learning with input and output space adaptation for pharmacogenomics", *Bioinformatics 36 (supplement_1) i380-i388*. Presented at *ISMB 2020,*

O. Snow, **H. Sharifi-Noghabi**, J. Lu, O. Zolotareva, M. Lee, M. Ester. (2019), "BDKANN - Biological Domain Knowledge-based Artificial Neural Network for drug response prediction", *MLCB 2019*.

H. Sharifi-Noghabi, O. Zolotareva, C. C. Collins, M. Ester. (2019), "MOLI: Multi-Omics Late Integration with deep neural networks for drug response prediction", *Bioinformatics* 35 (14), i501–i509. Presented at ISMB/ECCB 2019. Received 1,500 USD travel award from the conference.

H. Sharifi-Noghabi, et al.. (2019), "Deep Genomic Signature for early metastasis prediction in prostate cancer", *Recomb-CCB 2019.*

M. Mohammadi, **H. Sharifi-Noghabi**, H. Rajabi Mashhadi, G. Hodtani. (2016), "Robust and stable gene selection via Maximum-Minimum Correntropy Criterion", *Genomics* (170) 83-87. (joint first authorship)

Work experience

Research Intern, Princess Margaret Cancer Centre (Part time) **June 2020-Present**

- Designed and implemented a guideline for machine learning in pharmacogenomics.
- We performed an empirical study to assess the utility of machine learning methods under dataset shift in pharmacogenomics.

- Supervisor: Dr. Benjamin Haibe-Kains.

Research Assistant, Simon Fraser University (Full time) **Sep 2016-Present**

- Developed skills and basic understanding of transfer learning,cancer biology, and pharmacogenomics.
- Designed and developed novel methods in Pytorch and Keras for drug response prediction via: 1) domain generalization, 2) adversarial learning, 3) multi-task learning, and 4) meta-learning.
- Finished two specializations on Coursera related to deep learning and reinforcement learning.
- Collaborated extensively with Dr. Colin Collins at the Vancouver Prostate Centre.

Research Intern, GenomeDx Inc. (Research collaboration) **Sep 2017-Jan 2018**

- Developed a novel method in Tensorflow to predict metastasis in prostate cancer using Autoencoders and transfer learning on unlabelled and labelled genomic data and improved the accuracy compared to the state-of-the-art studies
- Developed skills to analyze data via R such as survival analysis and data visualization
- Obtained experience to collaborate with researchers with different backgrounds
- Supervisors: Dr. Elai Davicioni, Nicholas Erho, and Dr. Yang (Seagle) Liu

Selected course/personal projects during Ph.D.

Automatic chemical compounds design via Autoencoders using SMILES representation.

- The goal was to generate new molecules via Variational Autoencoders. The hypothesis is that its learned representation is rich enough to sample and generate new molecules from it
- Used SMILES representations of existing chemical compounds and trained the Autoencoder on them

Mini personal projects on Convolutional and Recurrent Neural Networks

- Vision: Applied CNN to image verification and recognition tasks
- Vision: Used neural style transfer to generate new arts
- NLP: Applied RNN models to synthesize Shakespeare's text
- NLP: Applied RNN to speech recognition and music synthesis

Technical and general skills

Programming languages: Python, C
Deep learning: Tensorflow, Pytorch, Keras
Data science: Matlab, R

Volunteer positions

PC member—Machine learning in Computational Biology conference, Vancouver, Canada (2019).

SFU Omics organizer—a group to provide an environment for students and other academics to come together to talk about their research related to Genomics, Proteomics, and Metabolomics. (2018-Present)