Mahdi Gilany

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Summary

- Over 4 years of professional experience in designing and implementing a wide range of deep learning models, **CNN**, **RNN**, **GAN**, **VAE**, Bayesian NN, and Transformers in a variety of projects. Also, highly familiar with GNNs and GPs.
- Solid and profound machine learning and deep learning background, both theoretical and practical.
- Strong background in programming languages such as Python, MATLAB, and C/C++, and software tools such as **PyTorch**, **TensorFlow/Keras**, Scikit Learn, Pandas.
- Self-motivated and adaptable, with a track record of successfully **designing essential experiments** and solving problems.
- Demonstrated ability to think critically, work hard, and meet deadlines. Committed to **collaboration** and communication in the workplace, and passionate about staying up-to-date with recent advances.

Experience

Research Assistant — Queen's University
Medical Informatics Laboratory — Sep 2021–Present

Primary research on diagnosing **prostate cancer** from **ultrasound RF images**:

- **Self-supervised domain invariant/disentangled representation learning:** Addressing domain distribution shift by learning domain (hospital, patient, etc) invariant feature representations or disentangling them from task features.
- **Self-supervised attention-based multi-instance learning:** Providing fine-scale predictions from coarse labels by applying attention on bag of feature embeddings and using attention maps.
- **Robust diagnosis with uncertainty quantification:** Achieving robust diagnoses by addressing the remained distribution shift and out-of-distribution samples by discarding unconfident predictions.

Research Assistant — RIT
Lab of Use-inspired Computational Intelligence — Sep 2019–Jan 2021

Primary research on **Bayesian deep learning** in two areas:

- **Neural architecture inference using beta-Bernoulli processes:** Inferring the posterior distribution over architectural hyper-parameters (number of layers and neurons) using stochastic variational inference methods.
- **Variational continual learning with a dynamic network:** Dynamically growing a neural network architecture in VCL setting to overcome neural capacity problem.

Machine Learning Engineer — Octa Company
Startup Studio Octa — Nov 2018–Jul 2019

- **Crypto currency price prediction with technical nalysis:** Predicting different crypto-coins' prices using time series analysis and RNNs.

Research Assistant — University of Tehran
Secure Communication Lab — Apr 2018–Jul 2018

- **Hand-gesture detection:** Developing a CNN-based deep learning model for detecting hand and identifying gestures in real-time.

Education

Queen's University — Ontario, Canada
PhD in Computer Science, GPA:4.0/4.0 — Jan 2021–Present
Supervisor: Dr. Parvin Mousavi, Co-supervisor: Dr. Purang Abolmaesumi

Rochester Institute of Technology (Transferred to Queen's) — New York, USA
PhD in Computer Science, GPA:4.0/4.0 — Sep 2019–Jan 2021
Supervisor: Dr. Rui Li

University of Tehran — Tehran, Iran
BSc in Electrical Engineering (major Communication), GPA: 3.73/4.00 — Sep 2014–Sep 2018
Thesis supervisor: Dr. Mohammad Ali Akhaee

Publications

[1] M. **Gilany**, P. Wilson, A. Jamzad, F. Fooladgar, M. N. N. To, B. Wodlinger, P. Abolmaesumi, and P. Mousavi, "Towards confident detection of prostate cancer using high resolution micro-ultrasound", in *International Conference on Medical Image Computing and Computer-Assisted Intervention (**MICCAI**)*, Springer, 2022, pp. 411–420.

[2] P. F. Wilson*, M. **Gilany***, A. Jamzad, F. Fooladgar, M. N. N. To, B. Wodlinger, P. Abolmaesumi, and P. Mousavi, "Self-supervised learning with limited labeled data for prostate cancer detection in high frequency ultrasound", *arXiv preprint arXiv:2211.00527*, 2022.

[3] K. KC, R. Li, and M. **Gilany**, "Joint inference for neural network depth and dropout regularization", *Accepted in Advances in Neural Information Processing Systems (**NeurIPS**)*, 2021.

Honors and Awards

- Queen's Graduate Fellowship/Award — 2021–Present
- NSERC MedICREATE Training Award — 2021–Present
- Queen's Conference Travel Award — 2022
- RIT PhD Merit Full Scholarship — 2019–2021

Skills

- *Data Science Tools* — *NumPy, Pandas, Matplotlib, Scipy*
- *Deep Learning Frameworks* — *PyTorch, TensorFlow/Keras*
- *Programming Languages* — *Python, MATLAB, C/C++, SQL, Java, R*

Relevant Courses

- Geometric Deep Learning (online, keynotes on Graph Neural Net)
- Deep Learning
- Statistical Machine Learning
- Reinforcement Learning
- Cyber-infrastructure (Parallel multi-thread Programming)
- Stochastic Processes
- Software Engineering Foundation
- Linear Algebra