Mahdi Gilany

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Summary

- Over 4 years of professional experience in designing and implementing a wide range of deep learning models for **challenging real-world applications**.
- Solid and profound background in machine learning and deep learning and fundamental concepts behind them such as **probability theory, Bayesian statistics**, linear algebra and optimization.
- Advanced expertise in programming languages such as **Python** and MATLAB and related software tools such as **PyTorch, TensorFlow**, Scikit Learn, and Pandas.
- Self-motivated and adaptable, with a track record of successfully **designing essential experiments**, solving problems, and **publishing in top-tier conferences**.
- 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**:

- Developing **self-supervised domain invariant/disentangled representation learning** model to address distribution shift by learning domain (hospital, patient, etc) invariant feature representations or disentangling them from task features.
- Developed **self-supervised transformer-based multi-instance learning** framework to detect prostate cancer at the scale of biopsy cores (bags) by aggregating and feeding patch SSL embeddings (instances) to transformer.
- Developed **uncertainty-aware label noise-robust** model to have clinically practical prostate patch classifier.

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

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

- Developed **probabilistic neural model inference** to select most plausible neural network depth from model posterior distribution given the data.
- Developed **dynamically expanding continual learner** model to overcome fixed capacity of neural networks using stochastic variational inference methods.

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

- Developed **RNN-based crypto currency price movement prediction** model to find patterns in price time series and forecast the next moves of the candles.

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

- Designed a **CNN-based hand gesture detection** model to identify various hand signs 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. K. KC, R. Li, and **M. Gilany**, "Joint inference for neural network depth and dropout regularization", in *Advances in Neural Information Processing Systemsn* ***(Neurips)***. [Link][Code]
2. **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)***. [Link][Code]
3. **M. Gilany***, P. Wilson*, 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*. [Link][Code]

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

- Deep Learning
- Statistical Machine Learning
- Reinforcement Learning
- Stochastic Processes
- Software Engineering
- Linear Algebra
- Cyber-infrastructure (Parallel Programming)
- Geometric Deep Learning (online)