

Mahdi Gilany

CONTACT

🌐 Personal Page 🌐 GitHub **in** LinkedIn ✉ Email: mahdi.gilany@queensu.ca

SUMMARY

Extensive machine learning and deep learning background, both theoretical and practical

Experienced in designing and implementing deep learning models for real-world problems with most up-to-date software tools

Excellent writing, teamwork, and communication skills acquired from prior industrial and academic experience and research publications

RESEARCH EXPERIENCE

Research Assistant

Medical Informatics Laboratory

Queen's University

Winter 21–now

My primary research is to develop deep learning models for diagnosing prostate cancer on ultrasound images. In this real-world problem, we are dealing with many medical imaging challenges such as low labeled-data regime, weak labeling, distribution shift, and prediction uncertainty. My project involves in addressing different aspects of this problem.

- *Robust predictions and confident diagnoses* seeks to answer how not to learn spurious features which hurt generalizability on unseen data, and if learned to some extent how to avoid disastrous predictions with uncertainty quantification. Robust predictions are critical in healthcare.
- *Self-supervised ultrasound representation learning* deals with learning abstract representations from readily available unlabeled ultrasound images. It essentially helps alleviating the need for large amount of labeled data, and naturally opens up ways to address weak labeling when combined with Transformers.

Research Assistant

Lab of Use-inspired Computational Intelligence

Rochester Institute of Technology

Fall 19–Winter 21

My primary research was to develop deep learning models from using probabilistic view. I worked on two main projects, probabilistic neural model inference and probabilistic continual learning.

- *Probabilistic neural model inference* deals with finding the most plausible (model posterior distribution) neural architecture warranted by data. It essentially learns neural architecture, i.e., depth and width, with some assumption on the space of models.
- *Probabilistic continual learning* deals with teaching a neural model to continually learn new tasks without forgetting the past. The devised neural model, for each task, learns to update the posterior distribution on weights to not forget the past and neural architecture to increase the capacity of network.

Machine Learning Engineer
Startup Studio Octa

Spring 18–Summer 18

My primary role was to develop deep learning models which can forecast the future price of common crypto currencies. My task was to collect data, develop deep learning models, and study the feasibility of "Technical Analysis" in forecasting future price using these tools.

EDUCATION

Queen's University

Ontario

PhD in School of Computing, GPA 4.0/4.0

Winter 21–now

Supervisors: Dr. Parvin Mousavi, Co-supervisor: Dr. Purang Abolmaesumi

Rochester Institute of Technology (Transferred to Queen's)

New York

PhD in Computing and Information Sciences, GPA 4.0/4.0

Fall 19–Winter 21

Supervisor: Dr. Rui Li

University of Tehran

Tehran

BSc in Electrical Engineering, GPA 3.73/4.0

Fall 14–Fall 18

PUBLICATIONS
[Google Scholar](#)

KC, Kishan and Li, Rui and **Gilany, Mahdi**, "Joint Inference for Neural Network Depth and Dropout Regularization", *Advances in Neural Information Processing Systems (Neurips)*, 2021.

Gilany, Mahdi, and Wilson, Paul and Jamzad, Amoon and Fooladgar, Fahimeh and To, Minh Nguyen Nhat and Wodlinger, Brian and Abolmaesumi, Purang and Mousavi, Parvin, "Towards Confident Detection of Prostate Cancer Using High Resolution Micro-ultrasound", *International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI)*, 2022.

Wilson, Paul* and **Gilany, Mahdi*** and Jamzad, Amoon and Fooladgar, Fahimeh and To, Minh Nguyen Nhat and Wodlinger, Brian and Abolmaesumi, Purang and Mousavi, Parvin, "Self-Supervised Learning with Limited Labeled Data for Prostate Cancer Detection in High Frequency Ultrasound", *arXiv preprint arXiv:2211.00527*, 2022.

HONORS & AWARDS

Queen's Graduate Fellowship/Award

21–now

NSERC MedICREATE Training Award

21–now

Queen's Virtual Travel Award

22

RIT PhD Merit Full Scholarship

19–21

TECHNICAL SKILLS

Data Science Tools

NumPy, Pandas, Matplotlib, Scipy

Deep Learning Frameworks

PyTorch, TensorFlow/Keras

Programming Languages

Python, MATLAB, C/C++, Java

TEACHING ASSISTANCE

Introduction to Computing Science I, Linear Data Analysis, Engineering Probability and Statistics, Linear Control Systems

RELEVANT COURSES

- Deep Learning
- Statistical Machine Learning
- Reinforcement Learning
- Stochastic Processes
- Software Engineering Foundation
- Linear Algebra