

# Mahdi Gilany

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## EDUCATION

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### Rochester Institute of Technology (RIT)

Ph.D. in Computer Science  
Golisano College of Computing and Information Sciences  
GPA: 4.0/4.0, Advisor: Dr. Rui Li

Rochester, New York  
Fall 2019–Current

### University of Tehran

B.S. in Electrical Engineering (Communication)  
School of Electrical and Computer Engineering  
GPA: 3.73/4.00, Advisor: Dr. Mohammad Ali Akhvae

Tehran, Iran  
2014–2018

## RESEARCH INTERESTS

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- Bayesian Deep Learning
- Continual Learning
- Deep Generative Modeling and Inference
- Machine Learning
- Statistical Inference
- Computer Vision

## RESEARCH EXPERIENCE

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### Research Assistant

PhD research, *Lab of Use-inspired Computational Intelligence*

RIT  
Fall 2019–Current

- **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.

### Research Assistant

Undergraduate Thesis, *Secure Communication Lab*

University of Tehran  
Spring and Summer 2018

- **Hand Gesture Detection:** Developing a CNN for recognizing different hand gestures by Keras and extracted skin pixels as features

## WORK EXPERIENCE

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### Research Scientist

Habibi Crypto-currency Trading Group

Tehran, Iran  
Fall 2018–Spring 2019

- **Crypto-currency Price Forecasting:** Predicting different crypto-coins' prices using time series analysis and RNNs

### Electrical Engineering Intern

Mataab Company

Tehran, Iran  
Spring and Summer 2016

- **Wind Speedometer:** Designing a wind speedometer by ultrasonic transceiver sensors and microcontrollers.

## SCHOLARSHIPS AND AWARDS

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- RIT Ph.D. Merit Full Scholarship. 2019–Current
- Exempted from M.Sc. entrance exam in University of Tehran as an exceptional talented student. 2017
- Ranked among top 0.1% in Iran's National University Entrance Exam with more than 220,000 participants. 2013
- Semi-finalist in both 26<sup>th</sup> Iranain National Mathematics and Physics Olympiads. 2013

## RELEVANT COURSES

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Graduate courses are indicated by † and audited are indicated by \*

- **Machine Learning Courses:** Statistical Machine Learning<sup>†</sup>, Deep Learning<sup>†</sup>, Quantitative Foundation<sup>†</sup>, Pattern recognition<sup>†\*</sup> | UCB Deep Learning (online)<sup>†\*</sup>, Deep Learning Summer School at University of Tehran.
- **Math, Probability, and Statistics Courses:** Stochastic Processes<sup>†\*</sup>, Statistical Inference<sup>†\*</sup>, Linear Algebra\*, Engineering Probabilities and Statistics, Calculus I-II, Engineering Mathematics.
- **Programming and Software Engineering Courses:** Software Engineering<sup>†</sup>, Cyberinfrastructure Foundations<sup>†</sup>, Advanced Programming (C++)\*, Introduction to Computer and Programming (C) | Python Programming (SoloLearn).
- **Others:** Computer Networks, Digital Signal Processing, System Analysis.

## SELECTED PROJECTS

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- Implementing **Bayesian neural networks** for both classification and regression using PyTorch.
- Implementing a **Convolutional neural network with various regularization techniques, e.g. Dropout and L2-norm**, for MNIST and FashionMNIST Classification using PyTorch.
- Implementing **Gradient Descent, Newton, and Quasi-Newton optimizers** using backtracking linesearch with MATLAB.
- Implementing dimensionality reduction algorithms such as **Neural Autoencoder, PCA, LDA, and Forward Feature construction** using PyTorch and Numpy.
- Implementing **Expectation-Maximization (EM)** algorithm for Gaussian Mixture Model using Numpy.
- Implementing various clustering algorithms such as **Agglomerative Hierarchical and k-means** using NumPy.
- Implementing various classifiers such as **SVM, KNN, and Linear with Basis Expansion** using NumPy.
- Implementing various pdf estimators such as **K-means, Parzen Window, and Histogram** using NumPy.
- **Multi-thread programming** for displaying Mandelbrot function with manual load balancing.
- Running a 3D Random Walk in multi-processing setting using **Master-Worker with Message Passing Interface (MPI)**.
- Designing and Implementing an hand-held remote controller with a screen for Persian Ghazal solar car using DRF wireless transceiver modules.
- Implementing a multi-functional module for text sending and receiving via sim card, GPS location finding, and server communication using microcontrollers and Sim808 module.
- FPGA implementation of a digital oscilloscope and a signal generator.
- FPGA implementation of analog signals' envelope detector using FIR/IIR filters and MATLAB Simulink.

## SKILLS

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- **Programming:** Python, MATLAB, Java, R, C/C++ | Verilog, VHDL |  $\text{\LaTeX}$
- **Deep Learning Frameworks:** Pytorch, Tensorflow, Keras
- **Data Science Libraries/Packages:** NumPy, Pandas, SciPy, Scikit-learn, Matplotlib, IPython, GPyTorch
- **Operating Systems:** Linux, Windows
- **Applications/Programs:** Pycharm, Visual Studio, R studio | Code Vision, Xilinx ISE, Quartus, Multisim, Modelsim
- **Others:** Cuda, GitHub, Conda, Microsoft Office, Trello, Slack

## TEACHING ASSISTANT

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- **University of Tehran:** Engineering Probability and Statistics, Linear Control Systems.
- **Amir High School:** Discrete Mathematics, Analytic Geometry for National University Entrance exam.

## LANGUAGES

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- **Farsi:** Native
- **English:** Fluent
- **TOEFL iBT:** (Nov. 2018): 81/120 (Reading: 25/30, Listening: 18/30, Speaking: 18/30, Writing: 20/30)
- **GRE:** (Nov. 2018): Quantitative Reasoning: 162/170, Verbal Reasoning: 142/170, Analytical Writing: 3/6

## PUBLICATIONS

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- [1] K. KC\*, M. **Gilany**\*, and R. Li, “Scalable neural architecture inference with bayesian nonparametrics”, *Under review (border-line score) in Advances in Neural Information Processing Systems*, 2020.

Equal contribution is indicated by \*.

PDF file will be provided upon request.

## REFERENCES

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Available upon request.