Peyman Gholami

(+1) 603 286 0118 | pegholami@gmail.com | LinkedIn | Google Scholar | Website

EDUCATION

P.hD. Student (RA), Computer Engineering, University of Illinois Chicago — Chicago, USA
Research Title: Fast and Communication Efficient Decentralized Learning — *Jan. 2022 – Present*
GPA: 4

M.Sc., Electrical Engineering, Sharif University of Technology — Tehran, Iran
Thesis Title: MDP and Deep Reinforcement Learning based Resource Allocation in Computation Offloading — *Sep. 2018 – Aug. 2021*
GPA: 3.75

B.Sc., Electrical Engineering, Iran University of Science and Technology — Tehran, Iran
Senior Project Title: Ranging Error Mitigation in UWB Localization with Machine Learning — *Sep. 2014 – Sep. 2018*
GPA: 3.71

RESEARCH INTERESTS

- Machine Learning, Deep Learning and working with big-data
- Decentralized networks and Machine Learning
- Wireless and mobile networking
- Computation offloading optimization in cloud and edge computing

PUBLICATIONS

- Gholami, Peyman, and Hulya Seferoglu. "Digest: Fast and communication efficient decentralized learning with local updates." IEEE Transactions on Machine Learning in Communications and Networking (2024).
- Gholami, Peyman, and Hulya Seferoglu. Communication efficient federated learning with differentiated aggregation. In 2nd Workshop on Advancing Neural Network Training: Computational Efficiency, Scalability, and Resource Optimization (WANT@ICML 2024).
- Gholami, Peyman, and Hulya Seferoglu. "Fast and Communication Efficient Decentralized Learning with Local Updates." Federated Learning and Analytics in Practice: Algorithms, Systems, Applications, and Opportunities. 2023.
- Gholami, Peyman, and Hulya Seferoglu. "Improved Generalization Bounds for Communication Efficient Federated Learning." arXiv preprint arXiv:2404.11754 (2024).

HONORS/AWARDS

- Awarded travel grant for conference attendance, including full funding for ICNP 2022, awarded by the US National Science Foundation (NSF), October 2022
- Ranked 51 in national university entrance exam for master degree, Summer 2018
- Ranked 1st among students of Electrical Engineering on 3rd year of B.Sc, Fall 2016 – Spring 2017
- Ranked 620 in the national university entrance exam, Summer 2014

RESEARCH EXPERIENCE

Presentation at Artificial Intelligence Modeling, Analysis, and Control of Complex Systems — June, 2024
The Ohio State University , Columbus, OH
- Preset our work, i.e., Gholami, Peyman, and Hulya Seferoglu. "Digest: Fast and communication efficient decentralized learning with local updates." IEEE Transactions on Machine Learning in Communications and Networking (2024).

Presentation at Federated Learning and Analytics in Practice Workshop at ICML 2023 — July 2023
Hawaii Convention Center, Honolulu, HI
- Preset our work, i.e., Gholami, Peyman, and Hulya Seferoglu. "Fast and Communication Efficient Decentralized Learning with Local Updates." Federated Learning and Analytics in Practice: Algorithms, Systems, Applications, and Opportunities. 2023.

Distributed Machine Learning Research Assistant — Jan. 2022 – present
Networking Research Lab (NRL), University of Illinois at Chicago.

- Remove the need for massive communications to synchronize the nodes without hurting the convergence time.
- Theoretical proof of convergence under some common assumptions prevailing in the literature and removing some restrictive assumptions like symmetric communication capability.
- Evaluating the performance of the proposed algorithm under different network typologies and data distribution over nodes.

Edge Computation Offloading Research Assistant   Sep. 2019 – Aug. 2021
Wireless Research Lab (WRL), Sharif University of Technology
- Modeled a computation task as a directed rooted tree graph to address dependencies between sub-tasks of a task.
- Developed a queuing network model to analyze computation offloading in mobile edge and cloud computing servers.
- Proposed and developed a delay-efficient static task allocation approach based on queuing theory.
- Proposed and developed a Lyapunov-based task allocation policy.
- Proposed and developed MDP and deep reinforcement learning-based delay-efficient task allocation.

Guest Lecturer for Machine Learning Applications in Communication   June 2018
Iran University of Science and Technology
- Presented application of machine learning in indoor localization to a group of undergraduate and graduate students.

Ranging Error Mitigation in UWB Localization with Machine Learning   Summer 2018
Mobile Broadband Networks Research Group, Iran University of Science and Technology
- derived additional features from UWB Localization signals and achieved better results compared to the paper by Wymeersch, Henk, et al. "A machine learning approach to ranging error mitigation for UWB localization." IEEE transactions on communications 60.6 (2012).

Teaching Experience

Teaching Assistant for Probability and Statistics course   Spring 2020
Dr. Ashtiani, Sharif University of Technology

Teaching Assistant for Analog Communication course   Spring 2018
Dr. Razavizadeh, Iran University of Science and Technology

Teaching Assistant for Signals and Systems course   Fall 2018
Dr. Jalali, Iran University of Science and Technology

Teaching Assistant Circuit Theory course   Fall 2016, Spring 2017
Dr.Arab Khaboori, Iran University of Science and Technology

Computer Skills

Computer Languages: Python, C/C++, Matlab
Operating Systems: Linux, Windows
Other Skills:
- Use PyTorch library to apply deep learning to different data types.
- Implement a range of machine learning, preprocessing, cross-validation, and visualization algorithms with Python.
- Implement reinforcement learning algorithms with Python.