Parsa **Nooralinejad**

Computer Science PHD Student

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Education

University of California-Davis

Ph.D. in Computer science — *2022 - Present*

Advisor: Dr. Hamed Pirsiavash

University of Maryland-Baltimore County (Transferred)

Ph.D. in Computer science — *2021 - 2022*

Advisor: Dr. Hamed Pirsiavash

University of Tehran

Bachelor's in Computer Engineering — *2015 - 2020*

Experience

University of California-Davis

Research Assistant — *Sept 2022-Present*

- Resuming our project on multi agent continual learning

Apple Inc.

Research Intern — *Jun 2022- Sept 2022*

- Designing a method to improve the accuracy of MobileViT architecture

University of Maryland - Baltimore County

Research Assistant — *Aug 2021- May 2022*

- Working with my advisor on Multi agent continual learning, Published one paper in **CoLLA 2022**
- For the purpose of efficiency of continual learning, proposed a method to compact the knowledge of neural networks. The paper is under review
- Working with my advisor, designed a baseline method for extremely low-budget active learning

IPM Institute For Research In Fundamental Sciences

Research Intern — *2018 - 2019*

- Worked on Designing a Hardware Accelerator for Training of Deep Neural Netowrks
- Published a Paper titled "TaxoNN: A Light-Weight Accelerator for Deep Neural Network Training" int the **ISCAS 2020** conference

University of Tehran

Research Intern — *2017 - 2018*

- Worked on a algorithm for solving the neuro-science problem "n-arm bandit"

Patents

Taxonn: a light-weight accelerator for training deep neural networks on the edge

- Hardware accelerator for neural network training

Publications

MCNC: Manifold Constrained Network Compression

Under Review

- Continuing PRANC and NOLA for further compression of neural networks

FAT-RABBIT: Fault-Aware Training towards Robustness Against Bit-flip Based Attacks in Deep Neural Networks

ITC 2024

- Introduced a defense mechanism to make neural network hardware robust to row hammer attacks.

BrainWash: A Poisoning Attack to Forget in Continual Learning

CVPR 2024

- Introduced an attack to infuse catastrophic forgetting in continual learning methods.

NOLA: Networks as linear combination of low rank random basis *ICLR 2024*

- Introduced a method to compress large language models

PRANC: Pseudo RAndom Networks for Compacting deep models *ICCV 2023*

- Introduced a method to shrink the required data to build a network almost 100x.

Sparsity and Heterogeneous Dropout for Continual Learning in the Null Space of Neural Activations *CoLLA 2022*

- Introduced a method to enlarge the null space of neural networks in order to increase the number of learned tasks in continual learning

A Simple Baseline for Low-Budget Active Learning

Arxiv

- Proposed a baseline for low budget active learning
- Outperformed all benchmarks in extreme budgets like 0.2% of data

TaxoNN: A Light-Weight Accelerator for Deep Neural Network Training *ISCAS 2020*

Accepted for Oral Presentation

- Proposed a novel method for accelerating the training process
- Designed a Area efficient Processing element with low power consumption that can do the training and inference tasks.

Honors & Awards

2014 **Bronze Medal,** Iranian National Olympiad in Informatics *Tehran, Iran*

2013 **Finalist,** Khwarazmi Festival *Tehran, Iran*

Projects

PRANC Map-Reducer *UMBC CV Lab*

Research assistant

- Implemented a new Map-Reducer for implementing PRANC to run it on large networks like ResNet18 PyTorch Map-Reducer was not suitable for this work.

Topic Labeling *University of Tehran*

Researcher

- Designing a cross lingual topic labeling algorithm for the university's archive.
- The algorithm is currently in use for classifying the publications in the University of Tehran and linking faculties from different schools who have similar research interests.

Obstacle avoidance robot *University of Tehran*

Student

- Designed a robot that will take commands from a remote control and warns the chance of collision
- Used AVR microcontroller with ultra-sonic sensors

KhaneBeDoosh *University of Tehran*

Student

- Used React.JS for front-end and Django, node.js, and java spring for back-end
- Implemented a website for searching for house and apartment
- Used MySQL and SQLite Databases

Personal surveillance camera *Personal*

Personal

- Designed a surveillance camera for my room
- Implemented the embedded C code on esp32-cam module, integrated with face detection.
- Implemented a secure streaming server using Django with push notification to the react-native app

M.I.A (My Intelligent Assistant) *Personal*

Personal

- Using google's speech to text API, Implemented a simple voice assistant for my laptop
- Capable to accomplish tasks such as creating or deleting files, typing, reporting status of time, weather, etc
- Use facial recognition to lock the laptop if an unauthorized person try to work with it

Skills

Programming Languages

C, C++, Java, Python, Javascript, HTML, CSS, PHP, Golang

Machine Learning

Tensorflow, PyTorch, NumPy, MATLAB, Pandas

Web and Application Development

React Native, ReactJS, Django, NodeJS, SQL

Hardware Design

Verilog, Quartus, ModelSim

Edge Devices

ESP modules, Arduino, AVR Microcontrollers, Raspberry PI, Cyclone FPGAs

Teaching Experiences

Machine Learning — *UC-Davis*

Teaching Assistant

Data Structure course — *University of Tehran*

Teaching Assistant

Artificial Intelligence — *University of Tehran*

Teaching Assistant

Discrete Mathematic Course — *University of Tehran*

Teaching Assistant

Data Science workshop — *Khatam University*

Teaching Assistant

Data Structure Course — *UMBC*

Teaching Assistant

Programming class — *Allameh Helli3 Highschool*

Tutor