BORNA BARAHIMI

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HIGHLIGHTS OF QUALIFICATIONS

- **Machine Learning Engineer** with over four years of experience in designing, implementing, and evaluating machine learning models utilizing tools like **Pytorch**, **Keras**, **TensorFlow**, and **Scikit-learn**.
- Proficient in advanced **Deep Learning** models including **transformers**, **ResNet**, **CNNs**, **RNNs**, and **generative models** such as **VAE** and **diffusion models**.
- Conducted research on self-supervised learning methods including **Barlow Twins**, **VICReg**, **CPC**, and **SimCLR** for **time-series** data.
- Published papers on **machine learning applications** in **IoT sensing technologies** using **WiFi CSI** data.
- Proficient programmer with **8+ years** of experience in **Python**, **C++**, **JavaScript**, and **R**.
- **Full-stack developer** who was responsible for creating a healthcare platform using **ExpressJS** for the backend and **ReactJS** for the frontend, including a Virtual Visit System with **WebRTC**.
- Experienced in **data visualization** using **Seaborn**, **Matplotlib**, **Metabase**, and **MS Office Suite**.
- Knowledge in **DevOps**, including creating **CI/CD pipelines** for **Docker containers**.
- Familiar with Bioinformatics by taking the "Biology Meets Programming: Bioinformatics for Beginners" course on Coursera
- Demonstrated expertise in **database** technologies, including **MongoDB**, **PostgreSQL**, and **Redis**
- Led technical teams, promoting agile practices and strategic collaboration with stakeholders.
- Proficient in **Git**, **shell programming**, and operating within **Linux** environments.

EDUCATION

M.Sc. Computer Science — Sep 2022 – Aug 2024
York University — *GPA:A+*

B.Sc. Computer Science — Sep 2018 – Jun 2022
University of Tehran — *GPA:3.62/4*

University Courses: Deep Learning (A+), Mobile Communications (A+), Machine Learning Theory (A+), Data Mining (A), Artificial Intelligence (A+), Statistical Methods (A), Convex Optimization (A) Database Management Systems (A+)
Summer School: The 2024 CIFAR Deep Learning Reinforcement Learning (DLRL) Summer School
Online Courses: Generative AI with Diffusion Models (NVIDIA), Learning SOLID Programming Principles (LinkedIn), Biology Meets Programming: Bioinformatics for Beginners (Coursera)

PUBLICATION

- **Borna Barahimi**, Hina Tabassum, "Context-Aware Predictive Coding: A Representation Learning Framework for WiFi Sensing" *[Accepted to IEEE OJ-COMS, awaiting publication]*
- **Borna Barahimi**, H. Singh, H. Tabassum, O. Waqar and M. Omer, "RSCNet: Dynamic CSI Compression for Cloud-Based WiFi Sensing," ICC 2024, Denver, CO, USA *[top-tier conference in communication]*[link to paper]

PROFESSIONAL EXPERIENCE

Algorithm Designer — Aug 2024 – Present
Cognitive Systems Corp. — *Waterloo, Ontario, Canada*

- **Focus:** Self-supervised Learning, Representation Learning, WiFi Sensing, Time-series.
- Dr. Mohammad Omer
- Using **machine learning** and **self-supervised learning** method for creating unified representations for motion sequence data.

Research Assistant — Sep 2022 – Present
York University — *Toronto, ON, Canada*

- **Focus:** Self-supervised Learning, Representation Learning, WiFi Sensing, Time-series.

- Supervisor: Dr. Hina Tabassum
- Using **self-supervised learning** frameworks such as **Siamese** and **Barlow Twins** for Human activity recognition (HAR) WiFi sensing.
- Improving SOTA accuracy by **6%** and outperforming supervised methods by **30%** in few-shot learning setting.
- Joint HAR WiFi sensing **classification** and **compression** using dilated CNNs and autoencoders for cloud-based sensing applications.
- Reducing the edge device computational requirements by **99%** without significant loss in accuracy.
- Served as peer-reviewer for IEEE TCOM, IEEE Communications Letters, IEEE IoTM, and IEEE Communications Magazine.
- Nominated for Best Thesis Award of York University
- **Skills:** Pytorch, Self-supervised learning, Weights & Biases, Slurm, Multinode Training

Research Assistant Sep 2021 – Jan 2022

University of Tehran

- **Focus:** Semi-supervised Learning for Parkinson's Disease (PD) Detection
- Supervisor: Dr. Bagher BabaAli
- Employed a pre-trained self-supervised model on online handwriting records (time series) with Part of Stroke Masking (POSM) for transfer learning to diagnose PD using handwriting records.

Fullstack Developer Jul 2019 – Jul 2021

VClinic

- **Focus:** Development of an all-in-One platform for doctors and patients.
- Developed services: appointment scheduling, virtual visits, electronic health records (EHR), and prescriptions.
- Built APIs using ExpressJS, and frontend Modules with ReactJS from scratch.
- Maintained servers, databases, Docker containers and CI/CD pipelines.
- Managed Cybersecurity attacks by restoring databases, maintaining backups, and risk assessment.
- Created a web-based virtual visit system using WebRTC and ReactJS.
- Collaborated with HR for interviewing and hiring and onboarding **three** talents.
- Promoted to tech team lead and utilized agile practices.
- Engaged effectively with executives and business stakeholders, leveraging expertise in software development and governmental insurance services.
- **Skills:** ExpressJS, ReactJS, WebRTC, Docker, MongoDB, PostgreSQL, Redis, CI/CD, Agile, Leadership, Software Development.

Robotics Programmer Oct 2016 – Jul 2019

AE High School

- **Focus:** Building Algorithms for RoboCup 2D Soccer Simulation League
- Designed algorithms for simulated multi-agents soccer simulations in C++.
- Taught programming to high school students.
- Attended international RoboCup competitions in Germany and Japan.
- Contributed to technical papers for RoboCup Symposium.
- **Skills:** C++, Algorithm Design, Teaching, Technical Writing

Teaching Experience

Computer Programming Instructor Jan 2024 – Aug 2024
Niagara College - Toronto *Toronto, ON, Canada*

- **Focus:** Delivering lectures on Mathematics and Statistics for Computer Studies.
- Preparing teaching and evaluation materials

Teaching Assistant Toronto, Canada
York University *Sep 2022 – Present*

- **Courses:** Python Programming, Intro. to the Theory of Computation, Discrete Mathematics for Computer Science
- Holding Python programming lab sessionsand tuturials for mathematics, ensuring an engaging learning environment.
- Evaluated and graded student assignments and projects, providing constructive feedback to enhance learning outcomes.
- **Skills:** Teaching, Python Programming, Theory of Computation

Head of Teaching Assistants
Karyar College *Aug 2020 – Sep 2023*

- **Focus:** Volunteer Teaching and Mentorship for unprivileged students in Computer Science
- Trained and onboarded new faculty members.
- Involved in training program planning and executions.
- Hold programming workshops for Python, HTML, CSS, and Javascript.
- Designed course projects and assess students' performance.
- **Skills:** Leadership, Teaching, Web Development, Python Programming

Teaching Assistant
University of Tehran *Sep 2021 – Feb 2022*

- **Course:** Intro. to the Theory of Computation
- Marked assignments and exams, providing feedback and solutions to improve learning.
- **Skills:** Teaching, Theory of Computation

Technical Skills

Core Languages: Python, C++, JavaScript (NodeJS), SQL, MATLAB, R, Bash

Machine Learning tools: PyTorch, Tensorflow, Keras, JAX, NumPy, Pandas, Scikit-Learn, SciPy, Slurm

Generative AI: Diffusion Models, VQ-VAE, GAN

Web Technologies: ExpressJS, ReactJS, DevOps, WebRTC, Django

Data Visualization Tools: Seaborn, Matplotlib, RStudio

Industry Knowledge: Backend and Frontend Web Development, Software Engineering, DevOps, Agile, Object-Oriented Programming (OOP), Model-View-Controller (MVC), REST API, Design Thinking

Miscellaneous: Git, Linux, Shell (Bash/Zsh), MS Office 365, GSuite, Docker, MongoDB, PostgreSQL, Redis, LaTeX