

Zarreen Naowal Reza

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Summary

- Expert in Machine Learning and Deep Learning with focus on computer vision and NLP
- Skilled in Generative AI, Prompt Engineering, and Few-shot Learning
- Proficient in Python, PyTorch, TensorFlow, PySyft, MLOps
- Privacy-preserving AI developer and independent researcher at OpenMined
- IBM Certified Associate Developer in Quantum Computing
- Award-winning participant in NASA Space Apps Challenge 2020
- 3rd place winner in Thales Student AI Innovation Championship 2018
- Highly self-motivated, organized, and diligent
- Experienced in leadership, mentorship, and consulting
- Proven success in both team and independent work

EXPERIENCE

JACOB

Feb. 2023 – Present

Senior Applied AI Research Scientist / Project Manager

Montreal, QC

- Developed an AI-powered recommendation system to recommend startups to potential advisors using NLP techniques and Transformers
- Developed a student academic performance prediction model for a large CEGEP College in Quebec
- Leading Federated Learning, Privacy-preserving AI and MLOps initiatives in the organization
- Developing interactive applications using Generative AI (LLMs), Voice Synthesis, Prompt Engineering, and Few-shot Learning for clients in education and media sector
- Managing and planning sprints for a team of four AI professionals ensuring prompt milestones delivery
- Mentoring junior AI researchers and leading code review, code refactoring, and standardization efforts across the organization

Tech stacks used: NLP, Transformers, LLMs, Generative AI, MLOps, Asana for Agile Methodology

Volta Charging

Nov. 2021 – Jan. 2023

AI Research Scientist

Montreal, QC

- Worked at the intersection of high-quality research, data science, and applied machine learning to produce innovative ML solutions for EV charging stations
- Led and built multiple developments and deployment pipelines for ML solutions increasing company revenue by 30%
- Led the efforts in incorporating PETs and Ethical AI into new and existing AI projects as a PETs specialist in the company
- Implemented quick turnover POCs and demos using open-access and first-party data for internal clients, including the Sales, Marketing, and Station Engineering team

Tech stacks used: NLP for unstructured text, Deep Neural Networks, Regression, Optimization, PyTorch, Tensorflow, MLflow, Kubeflow, AWS, DVC, Docker, A/B Testing, Big Data, Snowflake, Postgres SQL

Thales Canada Inc., Guavus

Sep. 2019 – Nov. 2021

Data Scientist

Montreal, QC

- As part of core data science duties, I accomplished the following
 - Successfully developed and delivered multiple proofs-of-concept (POC), including root issue analysis with probabilistic graphical models, and user mobility prediction using Markov Chain
 - Helped customer success team build deal-closing product demo using ElasticSearch and Kibana dashboard
 - Quickly implemented cutting-edge machine learning algorithms proposed in research papers, including causal inference, Bayesian network, gaussian mixture model, and graph similarity resulting in performance improvement by 10 times
 - Other machine learning algorithms include SHAP AI explainer, Decision Trees, Xgboost, etc.
 - As part of MLOps duties, I accomplished the following
 - Developed the company's first end-to-end ML orchestration pipeline of machine learning POC, starting from development to deployment at scale and continuous monitoring
 - Built a prototype of an end-to-end MLOps pipeline at scale using Docker, Kubernetes, Argoflow, MLflow, Kubeflow, Seldon Core, AWS Lambda, Prometheus, and Grafana which was adapted across all engineering teams for future POCs
 - Performed thorough analysis of various MLOps frameworks in the market that helped the company design the most suitable MLOps architecture
 - Wrote production-ready code that complies with software development coding best practices and test-driven data science practices following agile methodology
 - Mentored interns, and worked collaboratively with researchers, engineers, and Customer Success team
- Tech stacks used:** Probabilistic Graphical Models, Gaussian Mixture Model, Bayesian Models, Markov Chains, Causal Inference, Regression, Forecasting, XGboost, SHAP, ElasticSearch, Kibana, Docker, Kubernetes, Mlflow, ArgoFlow, Seldon-Core, Grafana, AWS, JIRA, Git, SQL, A/B testing

Research Assistant, Machine Learning

Dec. 2017 – May 2019

Institute of Diagnostic Imaging and Research (IDIR)

Windsor, ON, Canada

- Built TensorFlow-compatible training data from custom SQLite DB3 database
 - Performed data cleanup, pre-processing, augmentation, and annotation from scratch
 - Implemented deep-learning-based computer-vision algorithms using Tensorflow and Keras for real-time weld quality analysis achieving industry-level performance resulting in the model being deployed in two automotive companies (BMW, Toyota) assembly plants
 - Trained junior students in Python Programming and Machine Learning to succeed in their co-op term
- Tech stacks used:** Deep Learning (CNN, Yolo, SSD, etc.), Signal processing (FFT), Tensorflow, Keras, Annotation tools, Ultrasonic b-scans image processing

OpenMined

Mar. 2020 – Present

Privacy-Preserving AI Research Engineer, open-source contributor

Remote, Global

- Projects include
 - [Large Language Model Auditing Blog post series](#)
 - End-to-end encrypted deep learning model for mental health disease detection from fMRI images using Differential Privacy, Federated Learning, and Secure Multi-party Computation
 - Private Deep Learning of Medical Data for Multiple Hospitals using Federated Learning and Differential Privacy (Presented in [PriCon 2020](#))

- Course content design and development for Private AI Series funded by FacebookAI, PyTorch, and the University of Oxford
 - Federated Learning Course – In this lesson, I taught about how to use federated learning to access and manipulate data on remote devices using PyTorch and PySyft. Students get to practice hands-on coding with PyTorch-based privacy-preserving AI libraries to analyze data and train a deep learning model. Course codes are available [here](#).
 - Core technologies include PySyft, PyTorch, diffprivlib (DP library by IBM), Tensorflow-Federated
 - Other roles include writing blogs, mentoring, organizing boot camps, advising the education team, etc.
- Tech stacks used:* Differential Privacy, Federated Learning, Deep Learning, PySyft, TFF, PyTorch

Women Who Code (WWCode)

Jul. 2021 – Sep. 2022

Leadership Fellow, Aug. 2021 – Sep. 2022

Remote, Global

- Led the Data Science Track consisting of 4500+ members in organizing free events, and workshops and building an empowering community that helps women excel in STEM roles
- Led a team of 50+ volunteers in program designing, event planning, and building technical content for online track events including webinars, workshops, hands-on coding tutorials, career growth, etc.
- Co-organized WWCode Hackathon for Social Good 2022 attended by 200+ participants and BlockDataPy 2022 Tech Summit – a one-day summit consisting of talks in blockchain, data science, and python
- Honed public speaking skills through speaking at 40+ events including annual summits and conferences

Tools used: Github, Monday Board, Canva, Notion, Kanban Boards

PUBLICATIONS

- Automated identification of sea pens using machine learning – The Alan Turing Institute (Sept. 2023)
- PySyft: A Library for Easy Federated Learning - SpringerLink (June 2021)
- Real-time Automated Weld Quality Analysis from Ultrasonic B-Scan using Deep Learning – UWindsor Archive (May 2019)
- Detecting jute plant disease using image processing and machine learning – IEEE Xplore (Sept. 2016)

EDUCATION

University of Windsor

Sep. 2017 - May 2019

Master's degree (Thesis), Computer Science

Windsor, ON

- Master's dissertation Real-time Automated Weld Quality Analysis from Ultrasonic B-Scan using Deep Learning got nominated for Governor General's Gold Medal by the Faculty of Computer Science
- Worked as a Research Assistant in IDIR and developed the first-ever AI-powered automated spot weld detection technology using deep learning partnered with BMW, Toyota, and NarmCo.
- Hired as a Graduate Teaching Assistant and Lab Tutor throughout the duration of the study
- 3rd Winner in Thales Student AI Innovation Championship 2018 out of 52 teams across Canada

AWARDS

- Finalist, AI Innovator of the Year – Women in AI Awards North America 2023
- Highly Qualified Personnel (HQP) - NSERC Create oN DuTy!
- Director's Honor Roll - Director, School of Computer Science, University of Windsor
- Governor General's Gold Medal (Nominee) - University of Windsor
- Going Beyond and Above in Research Award (Nominee) - University of Windsor