Amirreza Sokhankhosh

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Highlight of Qualifications

- **Machine Learning Engineering:** Proven expertise in developing and deploying **machine learning models** on **Google Cloud Platform** utilizing **VertexAI** and **BigQueryML**, contributing to scalable solutions and achieving significant performance enhancements.
- **Natural Language Processing:** Extensive experience implementing generative AI techniques, including utilization of **GPT-4** for **AI-powered grading**, streamlining evaluation processes and improving accuracy by **30%**.
- **Data Engineering:** Advanced proficiency in **data preprocessing** and **feature engineering** in **Python**, ensuring the integrity and quality of large-scale text datasets in production environments.
- **Collaboration & Communication:** Strong ability to collaborate with cross-functional teams, clearly articulating complex technical concepts to diverse stakeholders, enhancing project alignment and delivery.
- **Model Optimization & Evaluation:** Skilled in implementing and optimizing **machine learning algorithms** that significantly enhance model performance, as demonstrated through a **20% reduction** in training time in federated learning frameworks.
- **Research & Innovation:** Active contributor to advancements in **federated learning** and **distributed AI architectures**, with a history of research publications that demonstrate deep engagement with cutting-edge technologies.

Experience

University of Manitoba Sep 2023 – Jul 2025
Graduate Research Assistant *Winnipeg, Manitoba, Canada*

- Designed and developed four novel **distributed AI architectures** addressing critical challenges in **distributed learning**.
- Implemented and optimized these architectures using **TensorFlow**, **PyTorch**, and **Hyperledger Fabric** for advanced **AI model development**.
- Reduced communication overhead by **85.2%**, improved fault tolerance by **62.7%**, and enhanced energy efficiency, demonstrating effective **system optimization**.
- Authored research publications on topics involving **federated learning** and **blockchain integration**, contributing to advancements in machine learning techniques.
- Conducted thorough data preprocessing and feature engineering to ensure high-quality and reliable models using **Python**.

K. N. Toosi University of Technology Jun 2021 – Aug 2022
Research Assistant *Remote*

- Led an undergraduate research team in executing a complex study, utilizing advanced **data cleaning** and analysis techniques for large-scale datasets.
- Conducted comprehensive data collection of over **10GB** of raw data, ensuring high integrity and readiness for **model evaluation**.
- Applied causal inference techniques in **R** to analyze datasets, producing detailed reports that highlighted significant patterns and biases.
- Developed critical problem-solving strategies in team settings, enhancing collaborative efforts on research projects and ensuring alignment with project goals.

Bobo May 2024 – Aug 2024
Full-stack Developer Intern *Winnipeg, Manitoba, Canada*

- Accelerated product development by designing and implementing **RESTful APIs** and improving backend functionality using **PostgreSQL**.

- Automated data integration processes with **Python**, streamlining database functionality and enhancing data management capabilities.
- Collaborated closely with cross-functional teams to align API specifications with user interface requirements, ensuring seamless full-stack integration.
- Contributed to agile development processes, aiding in task management and team coordination using tools like **Jira** and **Confluence**.

K. N. Toosi University of Technology Jan 2021 – Jan 2023
Lead Teaching Assistant *Remote*

- Supported over **300** undergraduate students across complex subjects, enhancing technical communication and problem-solving skills.
- Designed and developed engaging lectures and coding projects, significantly improving student understanding of fundamental and advanced **computer science concepts**.
- Provided specialized support in areas such as **algorithm implementation** and **system architecture**, bridging theoretical knowledge with practical applications.

Projects

Paper Summarizer | *Python, PyTorch, Detectron2, EasyOCR, Flask* | Code

- Developed an intelligent summarization system leveraging **NLP** and **computer vision** to enhance the efficiency of research paper digestion.
- Implemented a multi-modal approach using **Detectron2** for object detection and **EasyOCR** for accurate text extraction, achieving a **70% confidence** level in identifying document components.
- Optimized model performance with **Flask** for real-time API calls, reducing average processing time for paper summaries by **25%** in production environments.

MarkMate | *Django, Flask, Python, React, GPT-4* | Code

- Developed an **AI-powered grading** system using **GPT-4** to automate assignment evaluations, significantly reducing grading time by **40%**.
- Implemented a **microservices architecture** with a **Django REST API** and a **Flask** LLM service facilitating efficient interactions between the backend and the AI model.
- Ensured model reliability and scalability by conducting comprehensive **data preprocessing** and **feature engineering**, leading to a 30% improvement in grading accuracy.

CIFAR-10 Generative Model Evaluation | *Python, PyTorch, ResNet-50, TensorFlow* | Code

- Developed a robust evaluation framework for generative models using **diffusion models** to assess image generation quality.
- Implemented a feature extraction process using a **pre-trained ResNet-50** model to compute metrics like **Precision**, **Recall**, and **F1 Score** through nearest-neighbor analysis.
- Achieved a **15% improvement** in model evaluation accuracy by integrating custom metrics that assess model generalization and alignment with real datasets.

PyFed | *Python, TensorFlow, scikit-learn, Sockets, Processes* | Code

- Developed a lightweight **federated learning framework** leveraging **TensorFlow** that enables seamless execution of FL algorithms on various datasets.
- Implemented a client-server architecture utilizing **sockets, processes, and threads**, facilitating model training and communication across distributed systems.
- Achieved efficient model training by demonstrating a **20% reduction** in training time per round through optimized weight averaging across clients.

Education

University of Manitoba Sep 2023 – Aug 2025
Master of Science in Computer Science (GPA: 4.4 / 4.5) *Winnipeg, Canada*

- **Relevant Coursework:** Security & Privacy, Deep Generative Modeling, Blockchain & Distributed Systems: A+

K.N. Toosi University of Technology Sep 2018 – Feb 2023
Bachelor of Science in Computer Engineering

Technical Skills

AI / Machine Learning: TensorFlow, PyTorch, Transformers, Scikit-learn, Keras
Languages: Python
Cloud & DevOps: Docker, Git, GitHub, CI/CD
Databases: PostgreSQL, MongoDB, MySQL, Redis
Web Frameworks: *Back-end*: Django, Flask, Express.JS. *Front-end*: React
Tools & Methodologies: Jira, Confluence, Agile, Scrum