Amirreza Sokhankhosh

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HIGHLIGHT OF QUALIFICATIONS

- **Generative AI & LLMs:** Leveraged **GPT-4** and other **large language models** to develop an **AI-powered grading system**, achieving a **30% reduction** in grading time and enhancing educational workflows.

- **Machine Learning Engineering:** Extensive experience with **TensorFlow** and **PyTorch**, demonstrated through the design of distributed AI architectures that improved **distributed machine learning** capabilities by addressing federated learning challenges.

- **NLP & Computer Vision:** Created an intelligent summarization system with **NLP** and **Computer Vision** techniques, achieving a **70% confidence rate** in document processing and enhancing access to academic content.

- **Deep Learning & Neural Networks:** Designed advanced models, including a **Temporal Fusion Transformer** for predictive analytics in a federated learning system, improving model accuracy by **20%**.

- **Data Engineering & Analytics:** Optimized data cleaning processes for over **10GB** of raw clinical data using causal inference techniques to support impactful, data-driven healthcare solutions.

- **Collaboration & Leadership:** Effectively led cross-functional teams and mentored over 300 students, enhancing their skills in **machine learning** and fostering innovation through collaborative projects.

- **Agile & Project Management:** Utilized **Agile methodologies** and project management tools (Jira, Confluence) to streamline development processes, significantly improving project workflow and communication across teams.

EXPERIENCE

University of Manitoba   September 2023 – July 2025
Graduate Research Assistant   *Winnipeg, Manitoba, Canada*

- Designed and developed four novel distributed AI architectures, significantly improving **distributed machine learning** capabilities and addressing critical challenges in federated learning.

- Implemented a blockchain-based **consensus mechanism** (PoCL) that reduced communication overhead by **85.2%** and enhanced **energy efficiency**.

- Optimized frameworks using **TensorFlow** and **PyTorch** for advanced model development, which facilitated scaling and improved fault tolerance by **62.7%**.

- Collaborated with cross-functional teams to publish research on AI methodologies, enhancing the understanding of **machine learning algorithms**.

- Authored research papers on innovative AI frameworks published in top-tier IEEE venues, driving advancements in **clinical data analysis**.

K. N. Toosi University of Technology   January 2021 – January 2023
Research Assistant   *Location*

- Led a research initiative analyzing complex datasets with **causal inference techniques** in R, culminating in findings that could drive **data-driven healthcare solutions**.

- Executed comprehensive data cleaning on over **10GB** of raw data to ensure high integrity and prepare data for advanced analytical applications.

- Facilitated teamwork, mentoring over 300 undergraduate students, and enhancing their problem-solving skills in **machine learning** and **data analysis** projects.

- Produced detailed analytical reports highlighting **subsidy biases**, providing insights relevant to **healthcare funding strategies**.

- Gained proficiency in **PostgreSQL** and **PostGIS**, enhancing capabilities in managing and analyzing large datasets.

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

- Accelerated product development by designing and implementing **RESTful APIs** to enhance backend functionality, ensuring seamless integration with front-end requirements.
- Automated data integration processes through a Python script that translated CSV data to SQL, demonstrating strong **Python** proficiency.
- Collaborated with cross-functional teams to align API specifications with user interface requirements, exemplifying effective **technical communication**.
- Utilized **Agile methodologies** and Atlassian tools (Jira, Confluence) to manage tasks efficiently, contributing to improved project workflow.
- Contributed to optimizing database management and accessibility, pivotal for deploying data-driven features in applications.

PROJECTS

Paper Summarizer | *Python, OpenCV, Flask, PyTorch, LLaVA, Ollama* | <u>Code</u>

- Developed an **intelligent summarization system** that utilizes **Natural Language Processing** (NLP) and **Computer Vision** techniques to analyze and summarize research papers from PDFs.
- Implemented **large language models** for generating comprehensive summaries, enhancing the summarization quality and **user accessibility** of academic content.
- Achieved a **70% confidence rate** in intelligent object detection for identifying document elements, streamlining processing time and improving **data extraction accuracy**.

MarkMate | *Python, Django, Flask, GPT-4, PostgreSQL* | <u>Code</u>

- Developed an **AI-powered grading system** using **GPT-4** that automates assignment evaluations based on customizable rubrics, enhancing grading consistency and efficiency.
- Implemented a **microservices architecture** integrating **Django REST Framework** and **Flask**, enabling scalable deployment and seamless communication between components.
- Achieved a **30% reduction in grading time** for instructors, significantly improving workflow efficiency and allowing educators to focus more on student engagement.

Federated Learning enabled Digital Twin | *Python, PyTorch, Temporal Fusion Transformer* | <u>Code</u>

- Implemented a **privacy-preserving federated learning system** leveraging **Hyperledger Fabric** to ensure data security and decentralized training for a smart building environment.
- Developed a **Temporal Fusion Transformer (TFT)** for precise prediction of temperature, CO2, and humidity levels across **76 rooms**, enhancing the system's forecasting capability.
- Achieved a **20% improvement** in model accuracy through collaborative training while maintaining **complete data privacy**, demonstrating the effectiveness of blockchain-enabled AI solutions in real-world scenarios.

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, Scikit-learn, Transformers, Numpy, Pandas
Languages: Python
Cloud & DevOps: Docker, Git, GitHub, Linux
Databases: PostgreSQL, MongoDB, MySQL, Db2
Web Frameworks: *Back-end*: Django, Flask, Express.JS. *Front-end*: React, Tailwind
Tools & Methodologies: Agile, Scrum, Jira, Confluence