Akram **Vasighi**

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Professional Summary

- PhD, Computer Science with strong background in machine learning, DNN programming & AI modeling.
- AI specialist with 5+ years of experience in implementing & deploying various industrial and academic projects.
- Successful background in leadership in developing large-scale AI models, leading to innovative patent.
- Proficient in Python, R, PyTorch, Scikit-learn, and various data analysis & machine learning frameworks.
- Strong publication records in computational biology & healthcare with valuable cross-functional team experience.
- Delivered courses, workshops, & presentations in top-tier conferences.
- Valued member of scientific journal reviewer community.

Work Experience

ML Engineer, App Developer, & Technical Lead, *Freelance* **08/2022 - Present**

- Initiated an automating workflow for data integration, cleaning, manipulation, and preprocessing, effectively communicating with stakeholders to understand their needs and streamline complex processes (C#, SQL, ETL).
- Led a patent project to drive innovative research, involving design & development of a new AI Agent-based tool to help researchers to perform and interpret complex single-cell RNA-seq (scRNAseq) analysis, especially those without programming expertise.
- Ensured testable, maintainable code, subprocess, and refactoring.
- Cross-functional team communication.

Research Assistant, *School of Computer Science & Windsor Regional Hospital* **09/*2024 - Present***

- Collaborated with diverse multidisciplinary research teams to identify therapeutically targetable tumour-immune interactions in small cell lung cancer (SCLC), contributing to impactful translational research.
- Communicated findings clearly and effectively with both technical and non-technical audiences, bridging gaps between computational and clinical teams.
- Developed machine learning models to identify predictive biomarkers in SCLC (~95% accuracy), while adapting models based on ongoing feedback and validation results.
- Took the initiative in refining the analysis pipeline, ensuring reproducibility and maintainability for future team use, and contributing to the preparation of publication.

Post-Doctoral Fellow, Data analyst, *School of Computer Science & Biomedical Science* **07/*2024 - 03/2025***

- Collaborated with researchers to analyze large-scale experimental genomic data (CRISPR screens), applying machine learning techniques and statistical analysis to detect biologically significant signals, with a focus on non-coding RNA regulation.
- Created an effective analysis pipeline to process, visualize, and analyze data, accelerating research timeline,
- running on GPU clusters.
- Work closely with researchers to understand and translate their needs into efficient computational solutions.

Research Assistant, *School of Computer Science, University of Windsor, Canada* **01/2020 - 04/2024**

- Demonstrated effective collaboration and mentorship; guiding undergraduate and graduate students to ensure individual and team success; clearly communicating complex research concepts, confidently leading collaborative projects, and applying strong problem-solving and writing skills to contribute to scientific publications and reports, while consistently meeting tight conference/presentation deadlines and research milestones.
- I designed and developed ML pipelines for large-scale data (including data gathering) to identify and characterize intercellular signaling networks as well as cell type annotation from single-cell transcriptomics data (scRNAseq).
- Trained deep learning models, embedding models, optimization, fine-tunning, and benchmarking, addressed the significant challenges of high-dimensionality and sparsity.

University Instructor & Graduate Assistant **01/2020 – 04/2024**

- Provided supportive mentorship and patient communication, guiding students through complex concepts, facilitating engaging discussions, and collaborating with faculty to enhance student success.
- Distributed Systems, Object-oriented programming using Java, Data Structure & Algorithms, Machine Learning, Deep Learning, Computer Networks, AI for Games, Cyber Ethics, C++.

Data Analyst, *Academic Data Centre, Leddy Library, University of Windsor, Canada* **01/2023 -04/2023**

- Applied strong analytical thinking in integrating NLP techniques for historical text analysis, effectively collaborating with library staff and researchers to facilitate meaningful interpretation and accessibility of archival resources.
- Helped instructors and speakers with 3 workshops for Codefest.

Help Desk, *Leddy Library, University of Windsor, Canada* **05/2022 – 12/2022**

- Provided approachable, patient, and clear communication while assisting students and faculty with technology troubleshooting, facilitating productive collaboration and enhancing user confidence in library IT resources.

Python Teacher (Volunteer**),** *Canadian Association for Girls in Science (CAGIS), Canada* **01/2022 -04/2022**

- As a best researcher in the Science department, I have been selected to teach Python to kids (7-12 years) using hands-on Python projects.
- I helped to brainstorm, organize, and plan STEM events for members.

Education

Ph.D. in **Computer Science**, University of Windsor, Canada **01/2020 – 04/2024**
M.Sc. in **Computer Engineering**, University of Tehran, Iran **09/2015 – 01/2017**

Technical Skills

Machine Learning & AI, Data Analysis

- Python | R | Pytorch | TensorFlow | Keras | Streamlit | LLMs (GPT) | API | CI/CD | RAG | AI Agents & Automation

Tools & Platforms

- Docker & Containerization | HPC | Bash/Shell Scripting | Data Pipeline & ETL | SQL | LaTeX | MCP | AWS

Bioinformatics Tools

- Scanpy | Seurat | Squidpy | DESeq2 | SAMtools | BEDTools | IGV | GSEA | Cytoscape | STAR | MaGeCK | CasoFFinder | Crisprscore

Leadership & Product Management

- Modularization & Scalable Architecture | Model Optimization & Fine-tuning | Documentation and Version Control (Git)| UI/UX Flow | Cross-functional Team Collaboration

Familiar with: Java | front-end technologies (HTML | React | TypeScript | Tailwind CSS | JavaScript | Responsive Design | GCP | Azure ML Studio, Reinforcement Learning techniques (RLHF), RecSys

Selected Publications & Presentations

[publications accessible via Google scholar profile *(https://scholar.google.com/citations?user=mJSJoqIAAAAJ&hl=en).]*

1. **A. Vasighizaker,** S. Hora, R. Zeng, L. Rueda, "SEGCECO: Subgraph Embedding of Gene expression matrix for CEll cell COmmunication prediction", Briefings in Bioinformatics, (**2024**).
2. **Vasighizaker, A**., Danda, S., & Rueda, L. "Discovering cell types using manifold learning and enhanced visualization of single-cell RNA-Seq data". Scientific Reports, Nature Portfolio, (**2022**).
3. Nakul Pandya, Raymond Zeng, Biren Dave, **Akram Vasighizaker**, Swati Kulkarni, Ming Pan, Junaid Yousuf, Luis Rueda, "Identifying Therapeutically Targetable Tumor-Immune Interactions in Small Cell Lung Cancer", WE-SPARK's Health Research, Canada, **2025**.

Honors, Awards, & Hobbies

- Member of International Society for Children with Cancer.
- Mitacs Research Training Award and NSERC Scholarship in AI.
- *Traveling, House Decoration, Embroidery, Cooking!*