Rakesh Khanna

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GitHub, LinkedIn

EDUCATION

McGill University, Montreal, Quebec, Canada | Fall 2020 - Spring 2024,
Major in **Computer Science**, Minor in Economics
GPA: 3.92/4.0

- **Dean's Honors List** (top 10% of graduating class)
- **J W McConnell Scholarship Award Recipient** (top 5% entering)
- **Scholarship of Excellence in Computer Science**
- Exchange semester (spring 2023) at the University of Copenhagen

WORK/RESEARCH EXPERIENCE

Software Engineer, Bioinformatics Scientist Sep 2024 - Present
Essential Software Incorporated, Rockville, Maryland

- Contracted to support cancer research at the National Cancer Institute's Center for Biomedical Informatics and Information Technology (CBIIT), within the Computational Genomics and Bioinformatics (CGBB) branch.
- Applies **vision foundation models** (i.e., UNI, CONCH, TITAN, PRISM) to **digital pathology** tasks including tumor subtyping, survival prediction and unsupervised clustering.
- Implements **explainable AI** methods (GradCAM, SHAP, and custom methodology) to extract biologically interpretable insights from multimodal models.
- Develops **MRI-based deep learning** pipelines for biomarker predictions, resulting in a manuscript submission to NPJ Precision Oncology (In Rebuttal)
- Technical lead in privacy preserving, multi-institutional collaboration using **federated learning** for survival prediction in Glioblastoma.
- Communicates complex technical knowledge and findings to diverse, multidisciplinary research teams.

Fellow, CRTA May 2022 - Jan 2023, Jun 2023 - Apr 2024
National Cancer Institute

- Prestigious research fellowship at the National Cancer Institute's Center for Biomedical Informatics and Information Technology (CBIIT).
- Presented machine learning and data science research in Glioblastoma to colleagues at the National Institutes of Health Poster Days and through publication in bioinformatics journals.
- Built custom multimodal PyTorch models and frameworks to study Glioblastoma subtypes, genomic profile, and survival.

Senior Leadership, Director of Finance and Analytics Jun 2018 - Dec 2022
Urban Beet, www.urbanbeet.org/ourstory

- Senior Leader in a not-for-profit organization dedicated to growing/distributing to families in need, and building urban farms at homeless shelters and at high schools.
- Helped to build 11 urban farms at in need locations across the United States.
- Recipient of numerous foundational and corporate grants resulting in over $25,000 of grant fundraising and $30,000 in grassroots funding.
- Developed a heatmap using USDA food insecurity data to highlight regions of greatest need in Washington DC and Dallas Texas.

PUBLICATIONS

Iryna Hartsock*, **Rakesh Khanna***, Qingrong Chunhua, Yan Chunhua, Asim Waqas, Ehsan Ullah, Michael Vogelbaum, Joaquim Farinhas, Ghulam Rasool, Daoud Meerzaman, "IMG-100. Cross-Institutional Validation of a Multimodal Deep Learning Model for Glioblastoma Survival Prediction", Neuro-Oncology, Volume 27, Issue Supplement_5, November 2025, Page v298, https://doi.org/10.1093/neuonc/noaf201.1179

Trinh Nguyen, Xiaopeng Bian, David Roberson, **Rakesh Khanna**, Qingrong Chen, Chunhua Yan, Rowan Beck, Zelia Worman, Daoud Meerzaman. "Multi-omics Pathways Workflow (MOPAW): An Automated Multi-omics Workflow on the Cancer Genomics Cloud." Cancer Informatics. 2023 Jun 16;22:11769351231180992. doi: 10.1177/11769351231180992. PMID: 37342652; PMCID: PMC10278438.

Rakesh Khanna, Fanyang Yu, Minkyu Park, James Tanis, Jun Guo, Chunhua Yan, Qingrong Chen, Jill Barnholtz-Sloan, Christos Davatzikos, Daoud Meerzaman. "Foundation Model-Enhanced Multimodal Survival Prediction in Glioblastoma Across Multi-Institutional Cohorts." npj Precision Oncology. Submitted 2025 Dec 13. (In Rebuttal)

Emily Boja, …, **Rakesh Khanna**, … "A Sustainable Data Jamboree Model to Enhance Cancer Data Utility." Scientific Data. Submitted 2026 March 12. (In Review)

CONFERENCE PRESENTATIONS

- "Traditional Model Approaches on FLAIMME: Lessons from Glioblastoma and Beyond," **American Association of Cancer Research, Invited Oral Presentation and Panel Discussion.** NCI Special Session, San Diego California, April 2026.

POSTER PRESENTATIONS

- "Leveraging an MRI Foundation Model to Enhance Survival Predictions in Glioblastoma: A Multimodal Deep Learning Approach." Rakesh Khanna. NCI AI Symposium. May 2025.
- "Predicting IDH1 Mutant Status in Patients With Glioblastoma Using MRI Imaging: A Machine Learning Based Approach." Rakesh Khanna, Daoud Meerzaman, NIH Poster Day. Aug 2023
- "Multi-omic Analysis of Smoking History and its Effect on Glioblastoma Survival Risk." Rakesh Khanna. NIH Poster Day. Aug 2022

TECHNICAL SKILLS

Languages and Frameworks: Python, R, C, Java, PyTorch, Lightning, Scikit-learn, Hugging Face.
Clinical ML: Survival analysis (lifelines, Cox PH), federated learning (NVFLARE), multimodal deep learning, TCGA/GDC data tools, multi-omics analysis.
Cloud & HPC: AWS, Google Cloud, NIH HPC (Biowulf), SLURM.
Dev Tools: Git/GitHub, Docker, Jupyter Notebooks, Claude Code, Agentic frameworks
Languages: English (Native), Mandarin (Intermediate), French (Beginner)

ADDITIONAL EXPERIENCE

Team Captain (2019-2020) of the Bethesda Chevy Chase Varsity Ice Hockey Team.
• Led team to state championship game in 2020 for best season in school history
• First Team All-Conference, Second Team All-State, All Tournament Team, Defensive Player of the Year (2020)