Yash Mali

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Education

University of British Columbia **Sep 2022 – Present**
BSc in Computer Science *Vancouver, BC*

Experience

Healthcare AI – Undergraduate Research **May 2025 – Present**
*UBC Medicine & BC Cancer (**co-op**, continuing part-time)* *Vancouver, BC*

- Built and deployed LLM agents that ingest medical guidelines and deliver evidence-based recommendations through natural language interfaces. Our work combines computer science, medical, and clinical research in collaboration with **UBC's Cloud Innovation Centre** .
- Current projects include **agentic NLP pipelines hosted on AWS** for bipolar disorder, depression, and cancer care. Also developed predictive pipelines that take in initial oncology reports and **predict survival rates**.
- Apart from the technical side of research, I have worked on securing partnerships with companies like AWS, submitted grants as a "co-investigator", and submitted research ethics board documents. Advised by Dr. John Jose Nunez.

ML Engineer – Undergraduate Research **May 2025 – Present**
UBC SCARP & ECE (part-time) *Vancouver, BC*

- Using latest developments in NLP and Computer Vision to analyze public records from Vancouver's housing development approval process. **This work bridges AI and social science to address Canada's housing crisis**. Advised by Dr. Julia Harten and Dr. Christos Thrampoulidis.

AI and Automation Developer **Sep 2024 – May 2025**
*Lux Bio (**co-op**)* *Vancouver, BC*

- Applied **AI-based drug discovery tools** like AlphaFold and ProteinMPNN to optimize sequences and 3D structures of enzymes. Revamped automation systems for bioprocess engineering – orchestrating sensors, pumps, motors, and valves.

Computer Vision & Automation – Undergraduate Research **May 2024 – Sep 2024**
*UBC Engineering @ Frostad Research Group (**co-op**)* *Vancouver, BC*

- Developed particle tracking software using an **ensemble of open-source computer vision models** along with a UI to correct mistakes. Automated and developed data collection software for new instruments invented by the research group. Helped with some day-to-day lab activities. Advised by Dr. John Frostad.

How Does Data Affect Pretraining? - Undergraduate Thesis **May 2025 – Present**
UBC ECE (part-time, course-based) *Vancouver, BC*

- I am researching how combinations of **diversity and noise in pretraining data affect generalization and learning dynamics** through controlled synthetic data while measuring factual recall and other metrics. I am investigating how the loss landscape and the model's representations change as a function of diversity and noise, as well as how different mixtures of diversities affect factual recall. Advised by Dr. Christos Thrampoulidis.

Interpretability in Domain Adaptation **Jan 2026 – Present**
UBC Computer Science (part-time, course-based) *Vancouver, BC*

- Continuing to work on an attention-based domain adaptation technique. Investigating how domain adaptation methods change representations and decision boundaries. Correlating properties of loss landscapes to generalization on increasingly distant distributions. Advised by Dr. Evan Shelhamer.

Quantum ML in Chemistry **Jan 2026 – Present**
UBC Chemistry (part-time, course-based) *Vancouver, BC*

- Investigating how variational quantum circuits encode chemical properties differently than classical machine learning models. Advised by Dr. Jolene Reid.

AI Curriculum Development **May 2025 – Dec 2025**
UBC Arts, prAxIs Team (part-time, course based) *Vancouver, BC*

- **Developing applied AI modules** in existing faculty of arts courses that highlight how AI can be used in their field. For example, sequence modelling in economics or computer vision in archeology. Funded by UBC's Teaching and Learning Enhancement fund (TELF). Advised by Dr. Laura Nelson and Dr. Jonathan Graves. More info here. I am **teaching** some modules like "Autoregressive models in economics". Work is submitted to the Conference on Teaching and Research in Economic Education. Tangentially, working on benchmarking LLMs for historical faithfulness.

Publications and Preprints

- **Mali, Y.**, Shelhamer, E. **2026**.

  AttenDence: Maximizing Attention Confidence for Test Time Adaptation.

  Contributions: As part of a graduate course project, I developed a novel test time adaptation objective based on the attention mechanism to improve robustness to corruptions without hurting on clean data. Planned for ICLR TTU Workshop 2026.

- **Mali, Y.**, Zeng, J., Heo, K., Zhang, G., Chen, J., Keramatian, K., Saraf, G., Solmi, M., Tam, E., Parikh, S., Schaffer, A., Beaulieu, S., Ng, R., Yatham, L. N., and Nunez, J.-J. **2025**.

  A Chatbot for the Management of Bipolar Disorder: Using Retrieval-Augmented Generation with an Open-Weight Large Language Model to Answer Clinical Questions Based on the CANMAT and ISBD 2018 Guidelines. *Canadian Journal of Psychiatry.* **Submitted, under review**.

  Contributions: Secured compute/hosting funding, prepared ethics board submissions, designed and implemented methodology, developed AWS backend, built initial frontend, contributed to evaluation framework, and wrote the initial draft.

- Phaterpekar, T., Zeng, Z., **Mali, Y.**, Leung, B., Ho, C., Ng, R. T., Bates, A. T., and Nunez, J.-J. **2025**.

  Investigating Fine-tuning versus Zero-Shot Learning for General Large Language Models when Predicting Cancer Survival from Initial Oncology Consultation Documents. *ESMO Real World Data and Digital Oncology.* **Submitted, under review.**

  Contributions: Designed and executed secondary experiments, helped engineer the ML pipeline, conducted evaluation analyses, and assisted in drafting/revising the manuscript.

- Nelson, L., Graves, J., **Mali, Y.**, and prAxIs Contributors. **2025**.

  Integrating Applied AI Modules into Economics Education. *Conference on Teaching and Research in Economic Education (CTREE).* **Submitted, under review**.

  Contributions: Developed applied AI education modules, contributed to curriculum design and implementation through Jupyter Notebooks. Among others, developed a "Autoregressive Models in Economics" module and taught it.

- Santos O'Keefe, L. M. A., **Mali, Y.**, and Frostad, J. **2025**.

  A particle cohort study (ParCS) of the impact of glucose and sucrose solutions on the kinetics of starch gelatinization. *Food Hydrocolloids.* **In press.**

  Contributions: Developed particle-tracking software and analysis pipeline, assisted with instrumentation setup, and contributed to drafting/revisions.

Talks and Presentations

- **Mali, Y.**, Nunez, J.-J.**2025**.

  AI in Clinical Decision Support for Mood Disorders. Mood Disorders Center Trainee Seminar **2025**. (Institutional, Invited Talk).

- Nunez, J.-J., Avery, J., Wu, S., Bates, A., **Mali, Y.**, Cook, O., and Chen, T. **2025**.

  Co-Designing AI for Cancer Care: Interactive Demo and Feedback on a Personal Navigation Assistant Prototype. BC Cancer Summit 2025. (National, Invited Talk). Only undergraduate speaker at the summit.

- **Mali, Y.** and Nunez, J.-J. **2025**.

  Agentic NLP for Medical Guidelines. CAIDA/TrustML @ ICML Visits 2025. (Institutional, Poster).

- **Mali, Y.** and Nunez, J.-J. **2025**.

  Agentic NLP for Medical Guidelines. UBC Psychiatry Research Day 2025. (Institutional, Poster).

- **Mali, Y.** and Nunez, J.-J. **2025**.

  Agentic NLP for Medical Guidelines. Multidisciplinary Undergraduate Research Conference 2025. (Institutional, Talk).

- Santos O'Keefe, L. M. A., **Mali, Y.**, and Frostad, J. **2025**.

  Quantification of Starch Gelatinization Properties in Glucose and Sucrose Solutions using ParCS and Deep Learning. Multidisciplinary Undergraduate Research Conference 2025. (Institutional, Talk).

Awards

Advanced Machine Learning Network: AML-TN — $ 5,000

April 2025

"AML-TN sponsored internships highlight the value of developing young researchers as the next generation of machine learning specialists."

2X Undergraduate Research Award: WLIURA — $ 6,000 Each

May 2024, 2025

"These awards subsidize professors to hire international undergraduate students to work full-time on their research projects in the Summer Session (May to August)."

Additional Experience

UBC AI Club – President **Jan 2025 – Present**

- President: Leading initiatives to encourage student understanding and future pathways in AI and ML. Started the AI reading group where we teach students interested in research foundational papers in deep learning.

UBC Uncrewed Aircraft Systems – ML Lead **Sep 2024 – Present**

- Leading the ML sub-team to explore and tune open-sourced models for object detection and tracking. This is a small piece of the puzzle on our drones that compete in two university-level autonomous drone competitions every year.

UBC Biological Internet of Things – Instrumentation **May 2025 – Present**

- Automating brewing/fermentation equipment with IoT-controlled devices while also trying to make glow-in-the-dark beer using green fluorescent protein (GFP).

References

John-Jose Nunez, MD, MSc, FRCPC
Assistant Professor, Department of Psychiatry, University of British Columbia
Associate Medical Director, Supportive Care, BC Cancer
Email: johnjose.nunez@ubc.ca

Christos Thrampoulidis, PhD
Associate Professor, Electrical and Computer Engineering, University of British Columbia
Email: cthrampo@ece.ubc.ca

Laura Nelson, PhD
Associate Professor, Sociology, University of British Columbia
Email: laura.k.nelson@ubc.ca

Technical Skills

Languages: Python, Java, C#, C/C++, Java/TypeScript, R, MATLAB, PHP, Kotlin

Libraries/Frameworks: Slurm, scikit-learn, PyTorch, JAX, HuggingFace, Sentence Transformers, LangChain/Graph, DSPy, NumPy, Polars, OpenAI, TensorFlow, Pandas, CuPy, Open–CV, React, Node.js, Flask, JUnit

Tools: Git, SQL , Docker, Visual Studio Code, PyCharm, IntelliJ, Eclipse, Linux, Bash/Zsh, Azure, AWS SageMaker, Bedrock, Lambda, Gateway, Cognito & S3, Google Vertex AI