Gerd **Bizi**

Incoming Graduate Student · Medical Biophysics

University of Toronto

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Education

University of Toronto, School of Graduate Studies — *Toronto, ON*
MSc, Medical Biophysics — *2025 -*

University of Toronto, Faculty of Arts and Sciences — *Toronto, ON*
HBSc, Specialist in Computer Science w/ a Focus in AI, Major in Biochemistry — *2020 - 2025*
- **3.81**/4.0 cGPA

Research

Research Assistant - Predicting Bladder Cancer Recurrence from Wholemount Slide Images — *Toronto, ON*
Project Investigators: Dr. Martin Yaffe, Dr. Alison Cheung, & Dr. Anne Martel, Department of Medical Biophysics @ U of T; Dr. Wenchao Han, Division of Computational Pathology and Informatics @ Mayo Clinic — *May 2025 - Present*
- Finetuning SOTA computational pathology tools to perform feature extraction from gigapixel WSIs
- Using deep learning-based survival analysis frameworks to predict recurrence

Sr. Thesis Student - Pose-Constrained *ab initio* Reconstruction of Membrane Proteins for Cryo-EM — *Toronto, ON*
Project Investigators: Dr. John Rubinstein, Department of Medical Biophysics & Biochemistry @ U of T; Dr. David Fleet, Department of Computer Science @ U of T — *September 2024 - April 2025*
- Developing methodology to **restrict pose space** of membrane-embedded proteins to improve *ab initio* reconstruction
- Using segmentation results from Segment Anything Model (**SAM**) as priors to determine relative protein pose
- Building on supervisor's previous project, cryoSPIN, to use these priors to more accurately converge to high-resolution cryo-EM maps

Research Assistant - Multimodal Framework for Breast Cancer Analysis — *Toronto, ON*
Project Investigators: Dr. Martin Yaffe, Dr. Alison Cheung, & Dr. Anne Martel, Department of Medical Biophysics @ U of T — *September 2024 - Present*
- Developing **multimodal** methodology to determine breast cancer phenotypes from RNA-sequencing; and tomography, histopathology, fluorescence microscopy images
- Currently using statistical analyses to build model identifying breast cancer types from lumpectomies using gene and protein expression from multiplexing assay

Jr. Thesis Student & Research Assistant - Mitochondrial and Peroxisomal Protein Dynamics and Localization — *Toronto, ON*
Project Investigator: Dr. Peter Kim, Department of Biochemistry @ U of T — *January 2022 - April 2023*
- Investigated the interactions between BORG2 and BORG3 with cytoskeletal and mitochondrial fission machinery, using protein over-expression experiments to study their effects on mitochondrial dynamics
- Developed pre-processing pipeline for unbiased image thresholding and quantification of mitochondrial networks and individual mitochondrial length in selected ROIs
- Performed immunofluorescence assays in fixed cell samples to identify localization patterns of mitochondrial proteins OCIAD1 and Bcl-Rambo under antibody-staining and protein overexpression conditions

Work Experience

Course Developer for HMB201, HMB301, and HM491 (Biotech) *Toronto, ON*

University of Toronto, Department of Computer Science *February 2025 - Present*

- Developing Jupyter Notebooks introducing intermediate machine learning concepts such as **autoencoders** and **convolutional neural networks (CNNs)** for applications in computational biology, with a focus on gene expression analysis and medical imaging

Research Associate *Remote*

Pytri Inc. *September 2024 - April 2025*

- Working on Pytri's flagship gel electrophoresis analysis model, using **yoloV8** to analyze gel electrophoresis experiments
- Conducting market research to survey client needs for gel electrophoresis solutions

Teaching Assistant *Toronto, ON*

Faculty of Applied Science & Engineering, Faculty of Arts & Science *September 2023 - Present*

- Head TA for **MAT187 - Calculus II** (W2025), responsible for leading tutorials, grading, and assisting with course administration
- TA for **MAT188 - Linear Algebra** (F2024, F2023), leading tutorials and grading assignments
- TA for **MAT187 - Calculus II** (W2024), leading tutorials and grading assignments
- TA for **CSC300 - Computers and Society** (W2024), leading tutorials and grading assignments

Projects

Building a Pipeline to Analyze iPSC Differentiation through RNA-Seq Data *Toronto, ON*

Developer *May 2023 - April 2024*

- Developed a computational pipeline to analyze RNA-Seq data from iPSCs differentiating into cardiomyocytes
- Utilized statistical methods, *DeSeq2* and *edgeR*, to identify differentially expressed genes across time points
- Performed data visualization using correlation **heatmapping**, and **Cytoscape** to elucidate transcript patterns
- Identified gene candidates influencing differentiation efficiency and explored methods to optimize transcriptional regulation

Extracurricular Activities

RH Scholarship Foundation *Toronto, ON*

Director of Operations *January 2024 - Present*

- Managed operations and venue logistics for scholarship events, contributing to **$100,000+** in awarded scholarships
- Expanded outreach by representing RH Scholarship at key community events and student organizations
- Secured **$3,000+** in scholarships and developed partnerships with international embassies and professional associations

Albanian Student Association @ U of T *Toronto, ON*

President *September 2023 - Present*

- Revamping the association's constitution and launching new initiatives, including grad school panels and networking events
- Organized cultural and social events with **150+ attendees** and secured **$1,000+** in sponsorships

Think Pacific, Fiji *Vunimaqo, Fiji*

Volunteer *July 2023 - August 2023*

- Helped construct a medical care facility to improve healthcare access in rural Fiji
- Supported Diabetes Fiji's screening program and promoted mental health awareness in collaboration with local organizations
- Developed cross-cultural teamwork and project management skills through community-based initiatives

Skills and Qualifications

Languages	Albanian, French
Programming Languages	Python, C, Java, C++, R, MATLAB, JavaScipt/TypeScript, SQL
Technologies	PyTorch, NumPy, Pandas, SciKit Learn, PostgreSQL, MongoDB, Docker, Flask, React

Awards & Grants

2025	**Vector Scholarship in AI**, Vector Institute	*$ 17,500*
2025	**Merit Entrance Scholarship**, Department of Medical Biophysics, U of T	*$ 2,000*
2023	**RH Scholarship Recipient**, RH Scholarship Foundation	*$ 1,000*
2023	**James Morrow Scholarship III**, Victoria College, U of T	*$ 1,000*
2022	**Alfred and Isabel Bader Scholarship II**, Victoria College, U of T	*$ 1,000*
2022	**Laidlaw Scholar**, Laidlaw Scholars Foundation	*$ 12,500*
2022	**Summer Student Research Program**, Department of Biochemistry, U of T	*$ 5,000*
2021	**Alfred and Isabel Bader Scholarship I**, Victoria College, U of T	*$ 1,000*
2023, 2022, 2021	**Dean's List Scholar**, U of T	
2020	**U of T Book Award**, U of T	
2020	**LORAN Scholars Foundation Semi-Finalist Certificate**, LORAN Scholars Foundation	
2020	**Schulich Leader Scholarship Nominee**, Northern Secondary School	