

# Brenden Kadota

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## Summary

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Computer vision scientist with over 5 years of experience developing advanced image processing pipelines for medical applications. Specialized in deep learning and signal processing for medical imaging analysis.

## Education

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### University of Toronto, Toronto, Canada

**Expected Graduation May 2025**

Master of Science, Medical Biophysics, GPA: 3.92/4

- Over \$38,000 awarded in scholarships, grants, and awards
- Coursework: Biostatistics, Deep Learning: Theory & Data Science, Biomedical Applications of AI, Applied Machine Learning, Overview of Medical Imaging, Advanced MRI

### McGill University, Montreal, Canada

**Graduated Apr 2020**

Bachelor of Science, Honors Computer Science and Biology, GPA: 3.8/4

- First Class Honors

## Work Experience

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### Graduate Student

**2022 Sep - 2025 Mar**

Sunnybrook Research Institute, Toronto, Canada

- Designed and developed clinically relevant deep learning model to accelerate MRI scan time by leveraging correlated information multimodal MRI scans resulting in a 800% reduction in scan time.
- Co-developed a novel AI model for 4D (3D+time) MRI reconstruction and evaluated on multiple anatomies and MRI scan types to show scan time reduction over clinical methods by 400%.
- Interfaced with MRI hardware using C++ to program to execute custom scans, generating a 50GB dataset.
- Led six presentations on deep learning best practices and tools for MRI scientists and staff, resulting in two inter-lab collaborations.
- Optimized model training on SLURM HPC using the pytorch profiler resulting in 20% reduction in memory requirements and runtime.
- Engineered a statistical sampling model to prioritize high-value training data, boosting image reconstruction fidelity by 5% over leading ML benchmarks.
- Built a 100GB synthetic dataset to replicate production data, accelerating model training and supporting data-driven insights for multiple publications.

### Research Assistant

**2019 May - 2022 Aug**

Douglas Mental Health University Institute, Montreal, Canada

- Developed an open-source 3D MRI biomarker quantification tool, replacing proprietary software and enabling reproducible data processing workflows for extracting quantitative metrics.
- Developed a novel MRI simulator in MATLAB that accurately models signal behavior using quantum mechanics, enabling the design and testing of scan protocols without scanner access.
- Presented an end-to-end MRI data analysis and simulation pipeline at four international conferences, with recognition for clear communication of complex data processing workflows.
- Optimized MRI simulation throughput by engineering custom CUDA kernels, achieving a 20x speedup in data generation and preprocessing stages, enabling large-scale simulations for testing.
- Collaborated with interdisciplinary teams of clinicians and professors to collect, and analyze multi-patient datasets, enabling the classification of cancer subtypes through biomarker pattern recognition.

- Developed interactive 3D MRI overlay tools to spatially register and visualize biomarkers, enhancing interpretation of anatomical and functional data for research applications.

## Publications

1. **B. Kadota**, C. Millard, M. Chiew, Learned k-space Partitioning for Optimized Multi-Contrast Self-Supervised MRI Reconstruction, IEEE Transactions in Medical Imaging, 2025 (in preparation)
2. **B. Kadota**, C. Millard, M. Chiew, Learned k-space Partitioning for Optimized self-supervised MRI Reconstruction, Conference in IEEE Engineering in Medicine and Biology, 2025 (in review)
3. J Patel, **B Kadota**, C Sheagren, M Chiew, G Wright, Low-Rank Tensor U-Net for Accelerated Cardiac MR Imaging, International Workshop on Statistical Atlases and Computational Models of the Heart, 2024
4. S Senthil, **B Kadota**, P Truong, J Near, Retrospective frequency drift correction of rosette MRSI data using spectral registration, Magnetic Resonance in Medicine, 2023
5. C. Sheagren, **B. Kadota**, J. Patel, M. Chiew & G. Wright Accelerated Cardiac Parametric Mapping Using Deep Learning-Refined Subspace Models, International Workshop on Statistical Atlases and Computational Models of the Heart, 2023
6. C. Drogaris, A. Butyaev, E. Nazarova, R. Sarrazin-Gendron, H. Patel, A. Singh, **B. Kadota**, Jérôme Waldispühl, When online citizen science meets teaching: Storyfication of a science discovery game to teach, learn, and contribute to genomic research, Biochemistry and Molecular Biology Education, 2023

## Conferences

1. **B. Kadota**, C. Millard, M. Chiew, Learned K-Space Partitioning for Improved Dual-Domain Self-Supervised Image Reconstruction, ISMRM, Hawaii, 2025
2. **B. Kadota**, C. Millard, M. Chiew, Joint Multi-Contrast Image Reconstruction with Self-Supervised Learning, ISMRM, Singapore, 2024
3. **B Kadota**, B Strasser, W Oakden, J Near, MRSI Processing and Simulation Toolbox in the FID Appliance (FID-A), ISMRM Magnetic Resonance Spectroscopy Study Group, 2022
4. **B Kadota**, B Strasser, W Oakden, J Near, MRSI Processing and Simulation Toolbox in the FID Appliance (FID-A), ISMRM, London, United Kingdom, 2022
5. SV Senthil, **B Kadota**, J Near, Frequency and Phase Drift Correction of Rosette MRSI Data using Spectral Registration, ISMRM, London, U united Kingdom, 2022

## Awards

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| 1. ISMRM Trainee Stipend, \$845                                   | 2025 |
| 2. ISMRM Trainee Stipend, \$845                                   | 2024 |
| 3. Canadian Graduate Scholarship, \$17,500                        | 2023 |
| 4. Medical Biophysics Excellence Award, \$5000                    | 2023 |
| 5. Ontario Graduate Scholarship, (Alternate), \$15,000            | 2023 |
| 6. 3rd Best Presentation ISMRM MR Spectroscopy Study Group, \$200 | 2023 |