

# Brenden Kadota

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## Summary

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Computer vision scientist with over 5 years of experience in developing advanced image processing pipelines in the medical setting. Specialized in deep learning, signal processing, and image 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, Applied Machine Learning

### McGill University, Montreal, Canada

**Graduated Apr 2020**

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

- Graduated with First Class Honors, Dean's Honours list (2016)

## 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 from different MRI scans resulting in an 800% reduction in scan time.
- Co-developed a novel AI model for MRI reconstruction and evaluated it on 3D+time (4D) multi-view data, demonstrating a 400% scan time reduction compared to clinical methods.
- Interfaced with MRI hardware using C++ to execute custom scans, which were reconstructed with deep learning models to reduce scan times from 8 minutes to 1 minute.
- Optimized model training SLURM scripts on high performance computing 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 high-impact publications.

### Research Assistant

**2019 May - 2022 Aug**

Douglas Mental Health University Institute, Montreal, Canada

- Developed an open-source 3D MRI biomarker quantification tool, replacing \$5,000 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.
- 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.
- Developed interactive 3D MRI overlay tools to spatially register and visualize biomarkers, enhancing interpretation of anatomical and functional data for research applications.

## Skills and Technologies

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**Deep Learning:** PyTorch, HPC, Distributed Training/DDP, Slurm, WandB, CUDA, PyTorch Lightning

**Computer Vision:** Recurrent Neural Networks, Convolutional Neural Networks, Diffusion Models, ViT.

**Applied Math:** Fourier Analysis, Compressed Sensing, Convex Optimization, Bayesian Inference.

**Software Development:** Python, C++, Git, Linux, Windows.