



Alex Senden

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Skills

Languages: Python, JavaScript/TypeScript, SQL, Go, Java, C#, C++ , C

Machine Learning: PyTorch, Scikit-learn, HuggingFace libraries (Diffusers, Transformers, Datasets, Accelerate)

Tools: React, Next.js, Node.js, Linux/Unix, Git, REST, GraphQL, gRPC, AI/ML/DL, RAG, Docker, CI/CD

Techniques: Full-Stack & Cloud-Native Development, Distributed Computing, Microservices, Agile Methodology

Education

University of Manitoba – Master of Science in Computer Science 2024 – Present (*Expected 12/2026*)

- **GPA:** 4.50/4.50, **Advisor:** Dr. Christopher Henry
- **Teaching Assistant:** COMP 7950 - Deep Learning (Graduate Course)
- Awarded NSERC Canada Graduate Scholarship (CGS-M)
- NSERC CREATE in Computational Agriculture student (*partnership with the University of Saskatchewan*)

University of Manitoba – Bachelor of Computer Science Honours, Minor in Mathematics 2020 – 2024

- **GPA:** 4.50/4.50, Cumulative \$100,000 across 25+ scholarships
- Awarded Governor General's Silver Medal (*top 1 undergraduate across all faculties*)
- Awarded Faculty of Science Medal (*top 1 undergraduate in the Faculty of Science*)

Experience

Software Developer Co-op – Priceline.com May 2024 – August 2024

- Led cross-team integration of customer data into the phone sales agent platform, improving conversion rate
- Designed and implemented a system to allow phone sales agents to securely access a customer's saved payment methods while maintaining PCI DSS compliance, decreasing call handle time

Software Developer Co-op – Priceline.com May 2023 – August 2023

- Overhauled phone sales metrics system, greatly increasing the efficiency of GraphQL queries and implementing a more scalable metrics dashboard used by key stakeholders
- Automated periodic phone sales reports including a Slack integration for efficient monitoring

Software Developer Co-op – iQmetrix May 2022 – August 2022

- Redesigned load test infrastructure for backend services to increase efficiency of test creation
- Drafted an ADR to improve stability of a legacy system and presented the findings to stakeholders

Projects

Diffusion-based Dataset Augmentation for Downstream Image Segmentation Tasks *Ongoing*

- Modifying the DiT structure of Flux to produce segmentation mask outputs for use as downstream training data
- Training a custom segmentation VAE to translate between class-space and latent diffusion-space
- Using resulting model to improve segmentation performance on benchmarks and real-world data-scarce tasks

Blockchained Federated Learning for Task-Agnostic Privacy-Preserving Learning April 2025

- Evaluated Stable Diffusion models fine-tuned with FL under non-IID data with various aggregation schemes
- Implemented both blockchained and non-blockchained FL schemes, comparing performance
- Examined the value of the trained diffusion model as a dataset synthesizer for downstream CV tasks

Retrieval Augmentation for Library-Oriented React Code Generation April 2025

- Developed a novel template-based approach for evaluating LLM-generated library-oriented React code
- Compared various retrieval-augmented generation strategies to determine optimal workflows for React code
- Inverted my approach to quantitatively compare the internal complexity of popular open-source design systems