Gilberto Tumangday

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Education

University of Toronto - Toronto, ON, Canada **Sep. 2023 - May 2027 (Expected)**
Bachelor of Applied Science & Engineering - Computer Engineering, Minor in Artificial Intelligence (In Progress)

- Courses: Applied Fundamentals of Deep Learning, Software Design and Communication, Algorithms and Data Structures, Probability and Applications, Digital Systems, Computer Organization

Relevant Skills

Programming Languages: Proficient - Python, C++, C, Verilog, RISC-V Assembly, Java, CSS | Familiar - HTML, JavaScript, SQL, Bash
Frameworks & Tools: Proficient - Git, PyTorch, Pydantic, LlamaIndex, BERTopic, React, Node.js, Next.js, Vercel, Supabase, PostgreSQL | Familiar - NumPy, Scikit-learn, Mediapipe, Pandas, Matplotlib
Software & CAD: Proficient - LTspice, Quartus Prime, MATLAB, ModelSim | Familiar - SolidWorks

Experience

***Risk Analyst Intern* - Extendicare (Part-time)** **Aug. 2025 - Present**

- Designed and implemented compliance data extraction pipelines using LlamaIndex APIs, developing custom schemas informed by regulatory research and raw PDF reports.
- Validated extracted compliance data using the Pydantic library and evaluated performance metrics to iteratively refine schemas, improving accuracy and completeness of inspection report digitization.
- Planning and implementing next-stage analysis leveraging open-source LLMs for sentiment analysis and BERTopic clustering, to identify provincial compliance trends and support quality-of-care improvements across 160+ long-term care homes.

***Machine Learning Intern* - Sound of Molecules (Part-time)** **Jun. 2025 - Present**

- Assisting with ML architecture research and training on sonified molecular datasets to accelerate drug discovery through innovative multimodal representations.
- Extracted and consolidated molecular data from ZINC, ChEMBL, UniProt, and Protein Database APIs, processing hundreds of thousands of entries into CSV datasets and deploying them to AWS storage for scalable access.
- Designed and deployed a PostgreSQL database to organize and query molecular datasets, improving accessibility and supporting downstream machine learning workflows.

***Software Engineering Intern* - Wurkn HR** **May 2025 - Aug. 2025**

- Built a reusable React + CSS component library and developed MVP dashboards hosted locally with Vite, accelerating frontend development and enabling rapid UI iteration for a startup investor demo.
- Integrated collaboration platforms by connecting Microsoft Teams (Azure Bot) and Slack (Slack API app) to Supabase edge functions (TypeScript + SQL) for secure data ingestion and storage.
- Designed and implemented iterative LLM-based sentiment analysis pipelines using the OpenRouter API to analyze Teams/Slack submissions, with results automatically visualized in dashboards to showcase HR insights to potential investors.

Technical Projects

Deep Learning Model for Monocular Depth Estimation **Jun. 2025 - Aug. 2025**

- Designed and implemented a monocular depth estimation pipeline in PyTorch, combining a ViT-B/16 encoder with a multi-scale convolutional decoder and custom loss functions (scale-invariant, gradient matching, feature alignment) to improve depth accuracy and structural consistency.
- Engineered data ingestion from the Hypersim dataset (~50k RGB–depth pairs) with Python, NumPy, and PyTorch data loaders, reducing storage/preprocessing overhead and ensuring robust train/validation splits.
- Trained and evaluated models using AdamW, LR schedulers, and early stopping, achieving 92% accuracy on unseen indoor scenes, demonstrating generalization for 3D reconstruction, robotics, and AR.

TourisMate GIS – C++ Mapping Software for Tourist Navigation **Nov. 2024 - Dec. 2024**

- Built a C++-based GIS mapping application with an interactive UI for city exploration, featuring responsive design and intuitive navigation.
- Implemented A* (A-star) for route planning and optimized data access with min-heaps and hash maps—enabling fast and accurate direction queries.
- Integrated land data processing with Libcurl and Git-based collaboration, while conducting applied research on algorithmic performance and UI readability, ensuring both computational efficiency and user-friendly design.