

Mathys Loïselle

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Education

Bachelor of Computer Science (Honours); Minor in Mathematics & Statistics Sep 2022 – Dec 2026 (Expected)

Concordia University – Montréal, QC

- **Awards:** Dean's List (Summer 2023 – Fall 2025); Québec Perspective Scholarship (\$5000, 2023 – 2024)
- **Coursework:** Machine Learning, Computer Vision, Linear Algebra, Multivariable Calculus I & II

Experience

Undergraduate Student Researcher Mar 2025 – Present (1 year)

Mila - Quebec AI Institute – Montréal, QC

- Extended POYO for multimodal neural decoding under Dr. Guillaume Lajoie & Dr. Matthew Perich
- Trained model with multiple masking strategies for multi-session pretraining and single-session fine-tuning
- Ran large-scale multi-GPU experiments on Mila's SLURM cluster, tracking results with WandB
- Presented poster at NeurIPS 2025 BrainBodyFM Workshop and at the Montreal AI Neuroscience (MAIN 2025) conference

Lead Machine Learning Engineer Feb 2025 – Present (1 year, 1 month)

Space Concordia, Space Health Division – Montréal, QC

- Leading a team of 10 Bachelor's and Master's students on brain health research for long-duration spaceflight
- Designed transformer-CNN architecture for predicting structural brain changes from longitudinal MRI scans
- Built preprocessing and training infrastructure for multi-timepoint neuroimaging data

AI Software Developer - Internship Sep 2024 – Dec 2024 (4 months)

TaylorMade Golf – Carlsbad, CA

- Built full-stack chatbot with bidirectional voice interface using Azure Speech Services (Angular/C#)
- Developed color profile matching system to align RGB display output with CMYK printing (Python/React)
- Built anomaly detection using Mahalanobis distance to flag invalid product configurations before manufacturing

Computer Vision Engineer Oct 2023 – Jan 2024 (4 months)

Nano Stride – Montréal, QC

- Led computer vision development for Cody, a 5'8" robot answering campus questions via natural interaction
- Designed speaker identification combining TDOA, NLP context, and pose estimation for multi-speaker scenarios
- Built real-time head motion control using OpenCV and tiny-YOLO to direct robot gaze toward active speakers

Research

N. Krishna, M. Loïselle, A. Ryoo, M. Perich, G. Lajoie, [Towards a generalizable, unified framework for multimodal neural decoding](#), NeurIPS 2025 Workshop: Foundation Models for the Brain and Body (BrainBodyFM).

Projects

ConUHacks X – Degree Requirement Visualizer Jan 2026

- Built React/TS & MySQL web app using Gemini API to extract and visualize any university's degree requirements
- Implemented optimal prerequisite path generation and career alignment tracking

ConUHacks IX – Concordia Virtual Tour++ Feb 2025

- Built Concordia Virtual Tour platform, placing top 5 among 180+ project submissions at Quebec's largest hackathon
- Built 3D Gaussian Splatting visualization and integrated an LLM tour guide using HuggingFaceH4/zephyr-7b-beta

Reinforcement Learning Rocket League Agent Nov 2024

- Developed a PPO-based RL agent with curriculum learning, reward shaping, and database-backed progress tracking

IEEE Smart and Radio-Controlled Marshmallow Cannon Jun 2024 – Aug 2024 (3 months)

- Developed a real-time facial recognition and tracking system for IEEE Concordia's automated marshmallow turret
- Achieved low-latency targeting using Haar Cascade and KCF tracking, successfully demoed at Concordia Frosh

Technical Skills

Languages: Python, JavaScript, TypeScript, Java, C#, C++, C

Web & Cloud: React, Angular, Node.js, HTML/CSS, Azure, Firebase

Spoken: English (Native), French (Native), German (Beginner)

AI/ML: PyTorch, NumPy, Scikit-learn, TensorFlow

Tools: Git, VSCode, Jupyter, SLURM, WandB

Activities & Interests

Volunteer Work: HackDécouverte (Nov 2025), Gina Cody Open House (Oct 2025), Space Day (Sep 2025)

Student Organizations: IEEE Concordia, Google Developer Student Club, Concordia SCS, Ski & Snowboard Club

Research Interests: Machine Learning, Computational Neuroscience, Neural Decoding, Mathematics, Robotics, NLP