Mathys Loiselle

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Portfolio Website: mathysloiselle.work

TECHNICAL SKILLS

Programming | Python • JavaScript • Java • C • C++ • C# • TypeScript • Clojure • Erlang

AI/ML | PyTorch • TensorFlow • Keras • OpenCV • Dlib

Web & Cloud | React • Angular • Azure • Firebase • HTML/CSS • Bootstrap

Tools | VSCode • Git • JetBrains Products • Jupyter Notebook • Google Colab

Languages | English (Native) • French (Native)

EDUCATION

Bachelor of Computer Science, Honours **2022 - 2026 (Expected)**
Concordia University - Montreal, QC

- **Dean's List**: Fall 2023 - Winter 2025
- Relevant Courses: Data Structures & Algorithms (**A+**), Theoretical CS (**A+**), Computer Graphics (**A**)

Minor in Mathematics and Statistics **2022 - 2026 (Expected)**
Concordia University - Montreal, QC

- Relevant Courses: Multivariable Calculus I & II (**A+**), Linear Algebra (**A**), Probability & Statistics (**A**)

EXPERIENCE

Undergraduate Student Researcher **Mar 2025 - Present (8 months)**
Mila (Quebec AI Institute) - Montreal, QC

- Supervised by Dr. Guillaume Lajoie and Dr. Matthew Perich
- Focus on improving **neural decoding in brain-computer interfaces (BCIs)**
- Developing **multimodal transformer architectures** to enhance BCI performance

Lead Machine Learning Engineer - Space Health **Feb 2025 - Present (9 months)**
Space Concordia - Montreal, QC

- Lead team of ~10 ML engineers developing machine learning models for space-induced neurological changes
- Conduct novel research at intersection of **deep learning** and **neuroscience**, focusing on **brain structure prediction** during long-duration spaceflight
- Drive development of **scientific publication** investigating ML applications in space neuroscience

AI Software Developer - Internship **Sep 2024 - Dec 2024 (4 months)**
TaylorMade Golf - Carlsbad, California

- Implemented **complete voice features** for TaylorMade chatbot including STT, TTS, hands-free conversation mode, and real-time waveform visualization (Angular/C#/Azure)
- Developed automatic color adjustment algorithm (Python/React)
- Researched and implemented order processing **anomaly detection** using Mahalanobis distance, achieving reliable outlier identification through **multivariate statistical analysis** (Python)

Computer Vision Engineer **Oct 2023 - Jan 2024 (4 months)**
Nano Stride - Montreal, QC

- Implemented real-time **robotics head motion control** algorithms
- Built computer vision pipeline using **OpenCV/Dlib**
- Collaborated with cross-functional engineering team

PROJECTS

Reinforcement Learning Rocket League Agent **Nov 2024 - Dec 2024 (2 months)**

- Developed **PPO-based** reinforcement learning agent
- Implemented **curriculum learning** and **reward shaping**
- Created database tracking and learning progress visualization system

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

IEEE Concordia - Montreal, QC

- Developed **facial recognition and tracking** for marshmallow turret
- Implemented **Haar Cascade** as an efficient facial detection model
- Implemented **KCF tracker** as lightweight tracking framework
- Collaborated with multidisciplinary engineering team

Cody AI Service Robot **Oct 2023 - Dec 2023 (3 months)**

Nano Stride - Montreal, QC

- Developed real-time **facial recognition and tracking** for moving robot head
- Explored pairing of **TDOA system** with **speech analysis** and lip synching to identify target speaker
- Researched statistical and machine learning techniques
- Collaborated with multidisciplinary engineering team

Personal Portfolio Website **Aug 2024 (1 month)**

- Used **React** and **Tailwind CSS** to implement a responsive layout and modern UI
- Support for English and French languages
- https://mathysloiselle.work

AWARDS, ACTIVITIES, & INTERESTS

ConUHacks 2025 **Feb 2025**

Concordia University - Montreal, QC

- Placed in the **top 5** out of 180+ project submissions at **Quebec's largest hackathon**
- Implemented **3D Gaussian Splatting** to create high-fidelity, real-time renderings of iconic campus spaces for Concordia University's Virtual Tour platform
- Developed an intelligent tour guide using **HuggingFaceH4/zephyr-7b-beta** for natural language interaction
- Completed full-stack development and feature integration within **24-hour time constraint**

Member **Sep 2022 - Present (2+ years)**

- Google Developer Student Club (GDSC)
- Software and Computer Science Society (SCS)
- Concordia Ski & Snowboard Club (CSSC)

Research Interests

- Machine Learning, Deep Learning
- Mathematics & Statistics
- Neuroscience, Robotics
- Quantum Physics, Astrophysics