

# Mathys Loïselle

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LinkedIn: linkedin.com/in/mathysloiselle

Portfolio Website: mathysloiselle.work

## TECHNICAL SKILLS

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**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

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### Bachelor of Computer Science, Honours

2022 - 2026 (Expected)

Concordia University - Montreal, QC

- **Dean's List:** Fall 2023 - Fall 2024
- 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: Linear Algebra (A), Multivariable Calculus (A+), Probability & Statistics (A)

## EXPERIENCE

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### Undergraduate Student Researcher

Mar 2025 - Present (2 months)

Mila (Quebec AI Institute) - Montreal, QC

- Conducting research in Matthew Perich's sinthlab, focusing on improving **neural decoding in brain-computer interfaces (BCIs)**
- Developing **multimodal transformer architectures** to enhance BCI performance
- Exploring and implementing modality fusion techniques to improve information integration across modalities

### Lead Machine Learning Engineer - Space Health

Feb 2025 - Present (3 months)

Space Concordia - Montreal, QC

- Lead team of ~9 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)
- Research in CV, ML, and prompt engineering for POC development

## 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

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### 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

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### 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