

MARINE MOUTARLIER

Master student in robotics at EPFL, Master's thesis at Harvard University

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EDUCATION

Harvard University 09.2025 - now

Master's thesis at Harvard John A. Paulson school of engineering and applied sciences, **Biodesign Lab**

Further development and user testing of a soft wearable shoulder robot with sensor fusion and ML-based intention detection for adaptive arm-movement assistance.

École Polytechnique Fédérale de Lausanne (EPFL) 09.2019- now

MSc in Robotics specialization in medical robotics

- **Student Researcher** at **REHAssist** for the Autonomy exoskeleton & **IMOS** for computer vision
- **GPA:** 5.16/6.
- **Courses:** Neural interfaces, Legged robots, Machine Learning, Robotics, Mechanical, Electronics, Microcontrollers, Model predictive control, Image analysis, Computational motor control, Mathematics of Data, Computer Vision, Reinforcement Learning

BSc in Microengineering

- **Courses:** Sensors, Robotics and embedded systems, manufacturing, signal theory, optics, microfabrication, analog circuits, electronics, microcontrollers, material sciences, general physics, and mathematic.

EXPERIENCES

Operations intern at LEM Surgical, Bern, Switzerland 02.2025- 08.2025

Start-up specialized in robotic surgical robot that assists in spine surgeries. Calibration of the surgical robot arms, set up of the testing procedures and instructions, and validation of the master plan.

Teaching assistant at EPFL, Lausanne, Switzerland 09.2021- now

Helping first and second-year students with exercises. Engaging in conversation on questions related to the course to ensure they understand the topics well. Watching and correcting exams

Analysis I: Dr. Strutt and Dr. Mila; **Analysis III:** Dr. Strutt; **Analysis A:** Dr. Dubuis, **Analysis II for CMS:** Dr. Khukhro

FORUM at EPFL, Lausanne, Switzerland 08.2023- 11.2023

Participation of the organization the 2023 edition of the Forum. Designed the visuals of the forum: posters, displays, booths, tags, and the full week of logistics

Summer internship at Trinity College Dublin, Dublin, Ireland 07.2023- 08.2023

Design an experimental rig for recording electromyography signals in individuals with Amyotrophic Lateral Sclerosis.

Summer internship at Bnp Paribas, Paris & Annecy, France 07.2021 & 08/09.2022

Welcoming clients, helping them with money transfers, e-banking, actions on their bank accounts, access to the lock, giving accounting advice.

Machining internship at ETML, Lausanne, Switzerland 07.2022

Discovering the world of machining, fabrication of a clamp and a vise. It included milling, turning, and drilling.

Rocket Team at EPFL, Lausanne, Switzerland 09.2020- 07.2021

Structure team: design of the fin tails, body, nose cone of the rocket for the project Space Race, Vostok.

Internship in Foch Hospital, Suresnes, France 06.2017

Thoracic surgery department, with head surgeon Dr Édouard Sage. Discovery of daily tasks such as consultations, operatory bloc, pneumonectomies via celioscopy, pneumothorax, bi-lung transplants, and discovery of the intensive care

PROJECTS

Student researcher at IMOS: Unsupervised object discovery, detection, and dynamic predictions 2024/2025

- Unsupervised deep learning method to detect objects in scenes
- Utilization of self-attention, variational auto-encoders and transformer architectures
- PyTorch and TensorFlow proficiency
- Paper research, testing, and adaptation

Implementation of a stair controller for Autonomy exoskeleton at REHAssist 2024

- Inter-joint synergies for stair activities
- Validation of the design paths
- Corrections, curve fitting, mapping & finite state machine implementation
- Experiments, validation of the efficiency of the assistance

Lucid dreaming neural interfaces 2024/2025

Neural interface to induce lucid dreaming, with the clinical potential to help individuals process trauma, enhance creative problem-solving, and even improve motor skills

EPIDEMIC 2024

Developed a reinforcement learning method capable of containing an infection from spreading

COIN RETRIVAL project 2024

Use of computer vision techniques (Hough transform, kNN and CNN) to identify coins from Euro and Chf.

SALLY the soft sole 2023

Development of a pneumatic massaging sole using a proportional algorithm to regulate user chosen pressure. Designed and fabricated fully by ourselves

SKILLS & INTERESTS

Programming and Software: Python (Pytorch, Pandas, NumPy, CV2...), C++, MATLAB, Latex, AutoCAD, Catia, LT-Spice, Atmel, Logisim, 3D printing, wiring

Languages: French (Native), English (C1), Spanish (A2)

Research interests: Medical robotics and rehabilitation, Biomedical applications, Computer vision, Reinforcement

Personal interests: Rowing (qualified for the French national championship), skiing, traveling, design