

# IRVIN DALAUD

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Robotics engineer in the making, fluent in French and English, driven by curiosity and a desire to innovate. I aim to leverage my skills in Reinforcement Learning, Model Predictive Control and Signal Processing for the benefit of a research lab.

**Topics:** *Reinforcement Learning, Neural Networks, Model Predictive Control, Biological Signal Processing, Parametric CAD*

## EDUCATION

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<b>École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland</b> Master of Science in Mechanical Engineering Specialization in Robotics, Minor in Biomedical Technologies	2023 - 2026
<b>École Polytechnique (l'X), Palaiseau, France</b> Specialization in Mechanical Engineering International Exchange Program between EPFL and X	2022 - 2023
<b>École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland</b> Bachelor of Science in Mechanical Engineering	2019 - 2023

## PROJECTS

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### Neuroengineering & Robotics

*Development of a controller for a 13-DoF robotic hand sEMG-based*

- Enhanced an EMG decoding algorithm, making it robust to muscle fatigue using clustering techniques, filters theory and biological signal processing
- Implemented a grasp-force control routine for a robotic hand, using muscle co-contraction as input. Built on a ROS-topic, using Lab Streaming Layer.

### Control Engineering

*Quadrupedal Locomotion via CPG and Reinforcement Learning*

- Designed quadrupedal locomotion reinforcement learning framework
- Implemented a Cartesian PD controller and trained the quadruped locomotion policy with PPO
- Achieved quadrupedal gaits with Central Pattern Generator based controller, such as trotting and pacing

### Biomechanics & Robotics

*Design of an Actuated Virtual Rolling Sphere Knee Joint*

- Developed an optimization routine to produce the best approximation of the knee motion
- Programmed a parametric CAD model of the knee joint using the CADQuery Python library
- Implementation of an actuation system using servo motors, gears and Arduino Uno

### Control Engineering

*Rocket Control with Advanced MPC*

- Implemented controllers to complete tasks under simulated flying conditions for a small-scale rocket prototype using drones propellers.

- Utilized MPC model to address the highly nonlinear nature of thrust vector control and solve the challenge of unknown disturbance
- Developed both linear and nonlinear MPC regulators and MPC tracking controllers with or without offset

## WORK EXPERIENCE

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### **Elaia**

*Venture Capital Analyst*

2025 - now

*Paris, France*

- Sourcing innovative early-stage startups in deep tech sectors
- Conducting due diligence and writing investment memos
- Proceeding to Investment Committee in order to support startups

### **Wandercraft**

*Internship - Mechanical Engineering R&D*

2023 (5 months)

*Paris, France*

- Integration of a fall protection interface system for a walking assistance exoskeleton user
- Study of experimental data (force sensor/imu/logs) and modeling of human fall through numerical simulation (Python)
- Solidworks design, material characterization and selection, supplier monitoring, solution prototyping at the fablab, test bench assembly

### **HEC Lausanne**

*Research Assistant in Data Science*

2024 - Now

*Lausanne, Switzerland*

- Analyzing massive images datasets (up to 2B rows) using Sci-kit, PyArrow and web scraping tools
- Writing reports showcasing insights on the state of copyright in datasets for Machine Learning

## SKILLS

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### **Programming**

Python, Matlab, LaTeX, C, Arduino

### **Computer Assisted Design**

SolidWorks, Fusion360

### **Graphical & Motion Design**

Photoshop, Illustrator, After Effects, Premiere Pro, Figma

### **Languages**

French (Native), English (C1)