

Hugo Grall Lucas

ROBOTICS SOFTWARE ENGINEER

28 YEARS OLD | SWISS | FRENCH | PORTUGUESE

Rue des Fahys 143, 2000 Neuchâtel (Switzerland)

☎ +41 (0) 79 239 55 18 | 🌐 hugoGrallLucas

✉ gralllucashugo@gmail.com | 📱 grallH



OBJECTIVE

After graduating with an engineering degree from the School of Engineering at Lausanne (EPFL), I have been working as a research assistant at the University of Applied Sciences of Western Switzerland (HEIG-VD) for nearly three years. I am now looking for new opportunities to join R&D teams in industrial companies or startups.

► **Key strengths:** Robotics, software development, control systems, autonomy and curiosity

WORK EXPERIENCE

ROBOTICS SOFTWARE ENGINEER - ASSISTANT ACADÉMIQUE HES

Yverdon-les-bains, Switzerland

IAI, INSTITUT D'AUTOMATISATION INDUSTRIELLE

Jan. 2022 - Now

- Participation in various research and development projects funded by HES-SO, OFEN, or HEIG-VD (CFRT, OpenCN, AMM-FAUNA, etc.).
- Collaboration with industrial companies on the development and testing of robotics (ROS2, UR, ABB, Stäubli, etc.) and motion control (Beckhoff and Triamec) software solutions for R&D.
- Contributed to the school's open house by selecting demonstrators and creating workshops, while also assisting Bachelor of Engineering students in programming (C, MATLAB, Python), microinformatics, control systems, electronics, and robotics courses.

► **Key Words:** Industrial Robotics, C/C++, Python, MATLAB, Control Systems, Beckhoff, Automation

R&D ENGINEER (100% - 50%)

Lausanne, Switzerland

DISAL, DISTRIBUTED INTELLIGENT SYSTEMS AND ALGORITHMS LABORATORY

Aug. 2020 - Feb. 2021

- Testing and improving the high-level control algorithm developed during my Master's thesis with a real drone inside a fly arena.

MASTER INTERNSHIP

Villaz-St-Pierre, Switzerland

ROVENSO, AGILE ROBOTS FOR SECURITY AND SAFETY MONITORING OF INDUSTRIAL SITES

Sep. 2019 - Feb. 2020

- Realization of a web server composed of a database, a VPN server and a web interface used for monitoring the robot ROVéo (video live stream, live access to sensor values and management of the logs).
- Development of the software of a Pan Tilt Zoom (PTZ) camera module, mainly for tuning the two PIDs of the motors and for managing the video live streams from the sensor to the remote end user.

► **Key Words:** Robot Operating System (ROS), docker and Grafana, NodeJS

TRAINING PROGRAM

Lausanne, Switzerland

ECOLE TECHNIQUE - ECOLE DES MÉTIERS DE LAUSANNE, ETML

3 weeks in August 2016

- Use of drilling, milling and lathe machines to create various components. A personal project was also realized. (Chess pieces and the board)

EDUCATION

MASTER OF SCIENCE: Microengineering - Robotics

Lausanne, Switzerland

ECOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE, EPFL

Sep. 2017 - Jul. 2020

Main Courses

Aerial/Mobile Robotics, Deep/Machine learning, Advanced Control Theory, Model Predictive Control (MPC)

Master's thesis

Performance and Comparison Analysis of Linear Model Predictive Control on Reference Tracking Quadrotors (Grade : 5.75/6)

BACHELOR OF SCIENCE: Microengineering

Lausanne, Switzerland

ECOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE, EPFL

Sep. 2014 - Jul. 2017

Main Courses

Control Theory, Signal Processing, Microinformatics, Sensors, Conception and Design of Mechanisms, Electronics

HIGH SCHOOL DIPLOMA: Physics and Applied Mathematics

Neuchâtel, Switzerland

LYCÉE DENIS-DE-ROUGEMONT, LDDR

Sep. 2011 - Jul. 2014

Diploma Dissertation (Travail de Maturité)

Prime numbers: Properties, Characteristics and Application.
(Grade : 6/6)

ACADEMIC PROJECTS


MASTER PROJECT

Performance and Comparison Analysis of Linear Model Predictive Control on Reference Tracking Quadrotors

Full Time

DISTRIBUTED INTELLIGENT SYSTEMS AND ALGORITHMS LABORATORY, DISAL (EPFL)

Feb. 2020 - Jul. 2020

High-performance trajectory tracking is a challenging and essential task for quadrotor position control. The proposed algorithms are tested and evaluated in two distinct simulated environments, namely MATLAB and Webots. A comparative study is conducted between Linear and Nonlinear Model Predictive Control (MPC), with computational time assessed on real hardware (Raspberry Pi 4) while the physics simulations are run in Webots. (Summary )

► **Key Words:** Quadrotors, MATLAB & Simulink, Webots , C/C++


SEMESTER PROJECT

Simulations on Webots of a SLAM algorithm designed for the Khepera IV

10 hours
per week

DISTRIBUTED INTELLIGENT SYSTEMS AND ALGORITHMS LABORATORY, DISAL (EPFL)

Feb. 2019 - Jun. 2019

The objective of this work was to identify and implement a SLAM algorithm suitable for a specific multi-robot system. The robot used in this study was the Khepera IV, which has limited computational capabilities. An approach utilizing the robot's five ultrasonic sensors and its wheel encoders was tested in simulation on Webots. The final results were compared with those obtained using a standard LIDAR system. (Summary )

► **Key Words:** Mobile Robotics, SLAM, Localization, Navigation, Simulation, Webots , Khepera IV , C/C++

COURSE PROJECTS

Development of an Android application for tablet and smartwatch

3 hours
per week

COURSE : LAB ON APP DEVELOPMENT FOR TABLETS AND SMARTPHONES  (EPFL)

sep. 2018 - Jan. 2019

Development of a *Just-Dance*-like game for Android tablets and smartwatches. The music and the list of movements to perform are played on the tablet, while the smartwatch is used to collect accelerometer data, filter it, and send the data packets to the tablet. A classifier then runs to determine whether the correct movement was performed at the right time. This project was carried out by a team of three students.

► **Key Words:** Android, Java, Smartwatch, Signal Processing


THOR : A smart trash bin designed for the EPFL campus

10 hours
per week

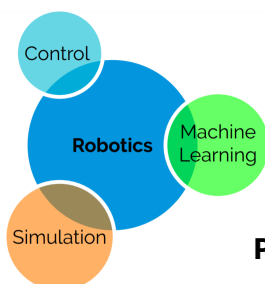
COURSE : PRODUCTS DESIGN AND SYSTEMS ENGINEERING  (EPFL)

Sep. 2017 - Dec. 2017

Design and prototyping of an IoT device. This project was carried out by a group of six students. The main concept was to develop a mechanical system to crush PET bottles manually using a lever. Additionally, smart features were integrated, such as counting the number of bottles, measuring the trash bag's fill level, displaying relevant information on a screen, and sending logs to a remote server. My contribution focused on the design of the mechanical components using Catia, as well as the assembly of the prototype.

► **Key Words:** Catia , prototyping, IoT device


SKILLS




LANGUAGES

French: Native
English: B1-B2
German: A2
Portuguese: A2

CODE

C / C++: ● ● ● ● ●
Python: ● ● ● ● ●
PLC: ● ● ● ● ●
Codeium : ● ● ● ● ●

SOFTWARES

ROS2: ● ● ● ● ●
MATLAB: ● ● ● ● ●
TwinCAT: ● ● ● ● ●
Fusion 360 : ● ● ● ● ●

REFERENCES

Giuseppe COSTANZO

Associate Professor

HEIG-VD

✉ giuseppe.costanzo@heig-vd.ch

☎ +41 (0)24 557 63 29

Direct manager and project manager.

Raoul HERZOG

Associate Professor

HEIG-VD

✉ raoul.herzog@heig-vd.ch

☎ +41 (0)24 557 61 93

Project manager.

Hugo MULLER

R&D Robotics Engineer

HEIG-VD

✉ hugo.muller@heig-vd.ch

-

Former colleague.