Alberic de Lajarte

Robotics and Deep Learning engineer

I have a strong background in control theory and system modeling. Over the years, I've gained broad experience across all areas of robotics: from mechanical design and embedded software to high level control and planning.

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Portfolio website

Experiences:

Professional:

Rouskin Lab – Harvard Medical School: Dec. 2022 – today
Fixed term: Research associate

- Leading a team of 4 researchers on a new deep learning based method for RNA structure prediction. (paper)
- Development of a bioinformatic pipeline for processing sequencer data, with improved automatic testing

LASA (Learning Algorithms and System Laboratory):
Nov. 2021 – Nov. 2022
Fixed term: Research engineer

- Development of a fast MPC for online motion planning, reducing planning failures and collisions by 60%
- Advanced torque control of collaborative robots

ClearSpace: July 2021 – August 2021
Internship: Dark room equipment

- Distributed application to control test facility and equipment
- Sensor calibration, actuator control, distributed computing

RUAG Space: September 2020 - December 2020
Internship: Research for GlexSys (ESA project)

- Design and tradeoff of gas-liquid transfer technologies to recycle the oxygen of the International Space Station
- New lab setup for automatic ozone sterilization

Gait Up: July 2020 - August 2020
Freelance project: Calibration mechanism for IMU

- Design, manufacture, and control of a three axes mechanism to automatically calibrate IMUs
- Reduced calibration time by 6 and improved precision by 2 compared to the previous manual calibration

Academic:

Control Laboratory: December 2020 - July 2021
Master thesis: GNC algorithms of a sounding rocket

- Optimal control and guidance using MPC, deployed on a sounding rocket and an electric drone (paper)
- Real time simulator based on ROS, with hardware and software in the loop capabilities

EPFL Rocket team: March 2018 - July 2021
Student project: Student developed sounding rocket

- *1st year*: Avionics team leader: Modular on-board computer used for navigation, control, and ground communication
- *2nd year*: System engineer: Leading the teams Avionics, Recovery, Simulation and Ground segment (100+ students) for a new rocket with hybrid propulsion
- *3rd year*: Project Manager: started new project on active stabilization and guidance of the rocket, published to ICRA 2021

Education:

- **Ecole Polytechnique Federale de Lausanne (EPFL):** Master in Robotic, minor in Space technologies *(2018-2021)*
- **Ecole Polytechnique Federale de Lausanne (EPFL):** Bachelor in Microtechnic *(2015-2018)*
- **Les Chartreux**: Baccalaureat Scientifique, with highest honors *(2012-2015)*

Skills:

Systems and control

- Optimal control (MPC, LQR), model-based control
- Sensor fusion, extended Kalman filter
- System identification, signal processing
- Numerical simulation and optimization
- Deep learning, machine learning

Programming and embedded systems:

- C/C++, Python, Matlab, Bash
- ROS, Linux, Git, Docker, Command line
- Electronic circuit and printed circuit board design

Manufacture and design of 3D part:

- Fusion 360, CATIA
- CNC, 3D printing and conventional machining

Miscellaneous:

- Microsoft Office (Excel, Word and PowerPoint)
- First aid training level 2 IAS
- Languages: French (native), English (fluent), Spanish (basic)