

# Jack Leckert

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## PROFILE

French-German Software engineer at Swift Navigation, specialized in Robotics localization, perception and controls.

RESEARCH INTERESTS	TECHNICAL SKILLS	PROFESSIONAL SKILLS
Model and learning based controls	Python, C/C++, SQL Linux / CLI Github / CI AWS, Kubernetes	French – native language German – native language English – C1 (TOEFL iBT 93)
Machine learning		
GNSS positioning		

## PROFESSIONAL EXPERIENCE

<b>Software engineer</b> <i>Swift Navigation, San Francisco, CA</i> Software engineer as part of the IoT team.	JULY 2024 – PRESENT
<ul style="list-style-type: none"><li>Proposed, led and built an automated data analysis software to optimize the quality and availability of Swift's base stations network. This effort led to the successful acquisition of 2 new customers.</li><li>Designed and built a suite of customer-facing REST APIs for real-time service indicators (geofencing, coverage).</li><li>Fine-tuned Starling positioning engine parameters using a genetic algorithm, leading to a 20% increase in 2D position accuracy of Swift's XGPS DashPro.</li><li>Developed various protocol converter for data processing and visualization.</li></ul>	
<b>Graduate student instructor</b> <i>UC Berkeley, CA, USA</i> Teaching assistant for the undergraduate class Experimentation and Measurements.	AUGUST 2023 – JUNE 2024
<ul style="list-style-type: none"><li>Preparing and supervising weekly labs of 20+ students, along 2 other GSIs.</li></ul>	
<b>Flight software engineer</b> <i>Skybase, Christchurch, New Zealand</i> Flight software engineer with the mission to develop a vision system for an autonomous retardant airplane.	FEBRUARY 2023 – JUNE 2023
<ul style="list-style-type: none"><li>Developed automated object detection functions for a remotely piloted flight control system.</li></ul>	
<b>Technology analyst intern</b> <i>Starburst Aerospace, Munich, Germany</i> Technology analyst intern as part of the Starburst Startup Accelerator in Munich.	MAY 2022 – OCTOBER 2022
<ul style="list-style-type: none"><li>Conducted one major consulting project about hot and harsh environment electronics for a European Tier-2 Aerospace supplier.</li><li>Assessed the technology viability of Aerospace startups and fit for the Starburst community (+300 startups).</li></ul>	

## EDUCATION

<b>Master of Engineering, Robotics</b> <i>University of California, Berkeley, USA</i> Focus on controls and machine learning. GPA: 3.96/4.00.	AUGUST 2023 – JUNE 2024
<b>Engineering degree, Robotics &amp; Mechanics</b> <i>École Centrale de Lyon, France</i> Computer science, machine learning, non-linear automatic control, numerical analysis, mathematics, solid and fluid mechanics, physics, material science, signal processing, electronics. GPA: 3.78/4.00.	SEPTEMBER 2020 – JUNE 2022

**Preparatory classes for the Grandes Ecoles**

SEPTEMBER 2018 – JUNE 2020

*Lycée du Parc, Lyon, France*

Two years of intensive preparatory classes for the French engineering schools nationwide scientific competitive examination (MPSI and PSI\*).

Mathematics, physics, mechanics, automatic control, computer science, chemistry.

**High School**

SEPTEMBER 2015 – JULY 2018

*Lycée Français Victor Hugo, Frankfurt, Germany*

Scientific Baccalauréat (high school diploma), highest honours.

One trimester of the 10<sup>th</sup> grade spent at Winnipeg, Canada.**RESEARCH AND ENGINEERING EXPERIENCE****UAV research project**

SEPTEMBER 2023 – JUNE 2024

*UC Berkeley, Hybrid Robotics lab*

Research project focusing on developing a controller for a flapping wing UAV using model-based control and reinforcement learning. Simulation software used is Mujoco.

- Drone design developed on Solidworks and converted to XML.
- Computation of fluid forces in C++ using aero strip theory (Wagner's model).
- MPC and RL controller developed in Python for the simulation.

**ESA AutoICE challenge**

FEBRUARY 2023 – MAY 2023

Deep learning challenge in partnership with DTU to automate sea ice mapping of the Arctic using Sentinel-1 SAR imageries.

- Selection of three main parameters to qualify: ice concentration, stage of development and floe size.
- Trained a U-net (contracting and expanding CNN) using parallel cloud computing from Azure.
- By fine-tuning hyperparameters, I reached F1 and R2 scores of about 80%.

**Fluid mechanics research project**

SEPTEMBER 2021 – MAY 2022

*École Centrale de Lyon, Fluid Mechanics and Acoustics Laboratory (LMFA)*

Research study focusing on reducing the drag force on a marathon runner by placing partners in a specific formation around him.

- Designed and machined a test bench using CAD and Fusion 360.
- Tested experimentally and analyzed the effects on the drag force when varying parameters (distance and angles) between the runners.
- Designed a formation by iteration allowing to save up to 2min 23s on a full marathon, or 27s less than the actual world record from E. Kipchoge during the INEOS 1:59 Challenge in 2019.

A research paper has been published in the Proceedings of the Royal Society A.

**Aerospace engineering project**

SEPTEMBER 2020 – JUNE 2021

*École Centrale de Lyon, Fluid Mechanics and Acoustics Laboratory (LMFA)*

Building of a supersonic rocket (the Centrale Transonic Rocket) with a team of 5 students as part of the national competition C'Space organised by Planète Sciences.

- Designed and built an electronic acquisition chain to save pressure data using C++.
- CAD designed and 3D-printed a rocket cone.

**VOLUNTEERING AND ASSOCIATIVE EXPERIENCE****President of a student organization**

OCTOBER 2020 – FEBRUARY 2022

*Centrale Lyon Conseil, Lyon, France*

Centrale Lyon Conseil is the Junior-Enterprise of École Centrale de Lyon, the analogue of a consulting club. Students apply their theoretical and practical skills to carry out projects in various engineering fields and work for a wide range of companies: startups, small or big enterprises and communities.

- Managed a team of 24 students in order to reach the goals of the strategy.
- Managed around 15 customer projects, including websites, engineering projects and market studies, resulting in a 150% increase in sales.