Jack Leckert

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PROFILE

French-German Software System 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++	French – native language
Machine learning	Linux / CLI	German – native language
GNSS positioning	Github	English – C1 (TOEFL iBT 93)
	AWS, Kubernetes	

PROFESSIONAL EXPERIENCE

Software System engineer   JULY 2024 – PRESENT
Swift Navigation, San Francisco, CA
Software System engineer as part of the IoT team.
- 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.
- Developed a binary protocol converter from Swift Binary Protocol to MCAP protocol to be compatible with various visualization platforms.
- Fine-tuned Starling positioning engine parameters using a genetic algorithm, leading to a 20% increase in 2D position accuracy of Swift's XGPS DashPro.

Graduate student instructor   AUGUST 2023 – JUNE 2024
UC Berkeley, CA, USA
Teaching assistant for the undergraduate class Experimentation and Measurements.
- Preparing and supervising weekly labs of 20+ students, along 2 other GSIs.

Flight software engineer   FEBRUARY 2023 – JUNE 2023
Skybase, Christchurch, New Zealand
Flight software engineer with the mission to develop a vision system for an autonomous retardant airplane.
- Developed automated object detection functions for a remotely piloted flight control system.

Technology analyst intern   MAY 2022 – OCTOBER 2022
Starburst Aerospace, Munich, Germany
Technology analyst intern as part of the Starburst Startup Accelerator in Munich.
- Conducted one major consulting project about hot and harsh environment electronics for a European Tier-2 Aerospace supplier.
- Assessed the technology viability of Aerospace startups and fit for the Starburst community (+300 startups).

EDUCATION

Master of Engineering, Robotics   AUGUST 2023 – JUNE 2024
University of California, Berkeley, USA
Focus on controls and machine learning. GPA: 3.96/4.00.

Engineering degree, Robotics & Mechanics   SEPTEMBER 2020 – JUNE 2022
École Centrale de Lyon, France
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.

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 10th 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 Artic 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.