Alexandre Carlhammar

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EDUCATION

Stanford University, Stanford, CA 09/24 - 06/26
M.S. in Aeronautics and Astronautics
Coursework: Orbital Mechanics, Distributed Space Systems Control, GPS, Optimal Control, Robot Autonomy, State Estimation, Deep RL, Decision Making Under Uncertainty, Comp. Vision

Swiss Federal Institute of Technology, Lausanne, Switzerland 09/21 - 06/24
B.S. in Mechanical Engineering, top 5% | GPA 5.7/6
Coursework: Product development, Feedback Control Design, Dynamics & Vibrations, Spaceflight, Turbomachinery, Combustion, Machine Design, Fluids, Thermodynamics, Heat Transfer, Mechanics of Solids, Data Science, Machine Learning, Embedded AI, Electronics

PROFESSIONAL EXPERIENCE

Stanford Robotics Center, Manufacturing Stanford, CA
Independent Research 01/26 - Present
- Leading new research effort on Rapidly Reconfigurable Manufacturing Cell for low level production

Stealth Aerospace Startup Hawthorne, CA
Founding Engineer 07/25 - 12/25
- Led end-to-end design and development of a high-performance UAS capable of ballistic launch and sustained flight at 300+ km/h, from concept through flight testing.
- Designed core airframe and wing structures and iteratively refined aerodynamic performance using CFD; selected and validated propulsion systems (BLDC motors and propellers) through bench and flight-relevant testing
- Architected and implemented a full-stack GNC system for GNSS-denied autonomous flight and precision target engagement, integrating multi-sensor fusion (IMUs, barometer, RGB and IR cameras) and evaluating RL-based modules
- Recruited and built a high-agency founding team across mechanical, electrical, and software engineering.
- Drove early-stage fundraising, leading investor pitches and gaining first-hand experience in closing capital.
- Established rapid feedback loops with weekly flight-testing campaigns in the Mojave Desert, maintaining a strong cadence of execution and delivery.

Stanford Space Rendezvous Laboratory (SLAB) Stanford, CA
Graduate Research Assistant 04/25 - 12/25
- Designing Foundational Spacecraft Operation Models (FSOM)

Defense Innovation Unit, Defense Innovation Fellowship Commercialization Pathway Palo Alto, CA
Co-lead, Systems Engineer *06*/25 - 08/25
- Hypersonics (very fast objects)

Stanford Navigation and Autonomous Vehicles (NAV) Lab Stanford, CA
Graduate Research Assistant 09/24 - 04/25
- Collaborating with Blue Origin for an upcoming rover mission at lunar south pole (2026)
- Engineering path planning algorithms for SLAM, producing sun-synchronous traverses between key sites
- Training NeRF models and 3D Gaussian Splats with lunar digital elevation models (DEMs) and orbit images
- Developing tools for real-time planning into hardware-in-the-loop systems with advanced simulations.
- Winning NASA's Lunar Autonomy Challenge

Bruhnspace Innovation Uppsala, Sweden
Distributed Space Systems Engineer 06/23 - 02/25
- Engineered an abstraction layer for accessing satellite sensors and deploying containerized applications to provide OS-level virtualization ("Space Kubernetes").

- Operationalized this architecture with a hardware-in-the-loop setting, using an array of FlatSats to facilitate rapid iteration. Established an automated pipeline to improve testing and streamline development.
- Developed a versatile and scalable data storage framework, allowing apps to access data across a satellite constellation, via S3 APIs.
- Devised an algorithm enabling data relay through intermediary satellites.
- Case study to apply ML models for hyperspectral space imagery analysis (e.g.: WorldFloods ML payload).
- Facilitated users' upload of applications and their testing in a simulated space environment by programing a GUI to simplify interaction with the project's architecture.
- Secured a grant from the Swedish Space Agency and NASA
- Deployed in real space environment onboard the ISS (Nov 2024) and upcoming NASA mission (October 2025).

IBM Zürich, Switzerland

Multi Agent AI systems Intern 06/24 - 09/24

- Designed and built large scale multi-agent Al systems, ensuring robust, efficient, and adaptable architectures for projects with international customers. Proof-of-concept projects across multiple domains, including marketing campaign optimization, insurance claim processing, and clinical study report generation.
- Optimized advanced Retrieval-Augmented Generation (RAG) systems, incorporating semantic chunking, query rewriting, and multi-agent modeling.
- Collaborated on the integration of Autogen and RAG with various AI pipelines, enhancing system interoperability.
- Led a team of 10 software engineers across Europe during the final 2 weeks, successfully deploying my solutions into Pfizer's production environment.

EPFL School of Computer and Communication Sciences/Institute of Mathematics Lausanne, Switzerland

Teaching Assistant

- Introduction to Computer Science (Autumn, Winter 2023 & Spring, Summer 2024)
- Algorithmics & Data Representation (Spring, Summer 2023
- Linear Algebra (Autumn, Winter 2022)
- Taught groups of 75-100 students - Rated at 5.75 out of 6 by students - Designed assignments and midterms

EXTRACURRICULARS & LEADERSHIP

Stanford Space Initiative Stanford, CA

Satellite Attitude Determination & Control System (ADCS) Team 09/24 - Present

- Designing 6DOF CubeSat simulation with orbit/attitude propagator, state estimator, actuator model, and control system
- Selecting reaction wheels, magnetorquers, and sensors to achieve detumbling, pointing, and perturbation handling
- Developing firmware and low-level software for 32-bit MCU RP2040 by integrating sensor control and raw data handling for CubeSat sensors (sun sensor, reaction wheels, star tracker, GPS, etc.)
- Implementing onboard EKF for state & attitude estimation to enhance real-time navigation accuracy

EPFL AI Team Lausanne, Switzerland

Founder and President 06/22 - 06/24

- Founded and led EPFL AI Team, the 1st student-led AI association in Switzerland. Community of 500 students to date.
- Raised over $25k from private sponsors like Google, Maxon and others.
- Piloted and established credited interdisciplinary projects, events, and competitions after connecting with labs and professors at EPFL, such as the Computer Vision Lab, to cross pollinate research and MSc theses' projects.
- Prototyped an autonomous robot quadruped 'BARK', to further future swarm and humanoid robot projects.
- Recruited the first 45 active members coming from 15 countries, including 20 MSc and PhD students.
- Awarded the MAKE Grant by EPFL (only 10 of 125 associations) for our interdisciplinary community impact.

European Rocketry Challenge Lausanne, Switzerland
Mechanical Engineer 09/21 - 06/22

- Led the design and manufacturing of Switzerland's first student-made bi-liquid tank for N2O and ethanol propulsion, handling pressures up to 80 bars.
- Successfully developed two coaxial tanks within a tight five-month timeline: one for rigorous testing and the other for actual flight.

PUBLICATIONS

"Deep reinforcement learning for satellite constellation and trajectory planning"

- 1st author workshop, Applied Machine Learning Day 2024, Lausanne, Switzerland

SKILLS

Programming: C, C++, Python, MATLAB, Go, LabVIEW
Design and Simulation: SolidWorks, Catia, Abaqus CAE
Guidance, Navigation & Control: LQR & PID Control, Kalman Filtering, Dynamics Modeling, Signal Processing, ROS
Containerization & Orchestration: Docker, Kubernetes
CI/CD Pipelines: GitLab, Jenkins
Languages: English, French, Spanish, Swedish