Léa Dubreil

About

French, 24 years old, Toulouse, France
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ResearchGate

Curious and open-minded engineer, I tend to participate in the creation of innovative systems. Constantly learning, I am driven by challenges and I am eager to improve my skills by your side. I ambition to become a researcher in machine learning applied to signal processing in the context of navigation. My persistent work and motivation are just waiting to work along with you.

Current research affiliations: ISAE-SUPAERO and TéSA

Education

Doctoral degree (Ph.D) 2023 – 2026
ISAE-SUPAERO, University of Toulouse, France
Department of Electronics, Optronics and Signal | NaviR²eS research team

- Thesis topic: *AI processing of degraded GNSS measurements at the input of a hybrid positioning algorithm.* Under the supervision of Gaël Pages (ISAE-SUPAERO), Samy Labsir (IPSA), Meryem Benammar (ISAE-SUPAERO) and Etienne Rouanet-Labé (Thales Alenia Space).
- Financially supported by TéSA, cooperative research laboratory in Telecommunications for Space and Aeronautics

Aerospace engineering diploma (Certified Eng. Dipl.) 2017 – 2023
Institut Polytechnique des Sciences Avancées (IPSA), France
Major: Aerospace engineer | Minor: Embedded systems and Telecommunications

- Final internship project: *Spacecraft Operations on OPS-SAT-1, the CubeSat demonstrator* Under the supervision of Lorenzo Ortega (IPSA) and David Evans (ESA).
- Final internship grade: 20/20 French scale (best grade), eq. 4.0 GPA. Before double degree: ranked 2nd of my promotion in 2021.

Master of Sciences (M.Sc.) Aerospace Technologies 2021 – 2023
Hochschule Bremen (HSB), Germany
Double degree | Minor: Space Systems

- Master's thesis: *Precise orbit determination of OPS-SAT-1 using Doppler shifts observations from ESOC-1.* Under the supervision of Lorenzo Ortega (IPSA) and Sören Peik (HSB).
- M.Sc. thesis grade: 1.0 German scale (best grade), eq. 4.0 GPA. Cumulative grade: 1.6 German scale, eq. 3.7 GPA.

Undergraduate semester abroad Fall 2020
University of Limerick, Limerick, Ireland
Erasmus program | Minor: Telecommunications

- QCA 3.84.

Publications

Conference proceedings

- Dubreil L., Labsir, S. Rouanet-Labé E., Pages G., Recurrent Neural Networks Modelling based on Riemannian Symmetric Positive Definite Manifold, *32nd European Signal Processing Conference (EUSIPCO), Lyon, 2024* — **Special session "Geometries for Signal Processing and Machine Learning", submitted**

Academic publications

- Dubreil L., Precise orbit determination of OPS-SAT-1 using Doppler shifts observations from ESOC-1, *Master's Thesis* — **Defended at the European Space Agency, ESOC, Darmstadt, Germany**

Research Interests

Statistical Signal Processing, Machine learning, Filtering, Riemannian Geometry, Constrained Optimization.
Applications to navigation systems: based on radar (during my M.Sc.) and GNSS (during my PhD).

Professional Experiences

Research engineer in space navigation and machine learning | *Doctoral contract* Oct. 2023 – Oct. 2026
TéSA, cooperative research laboratory in Telecommunications for Space and Aeronautics, Toulouse, France

Research engineer in machine learning for navigation | *Fixed-term contract* June 2023 – Oct. 2023
ISAE-SUPAERO, Toulouse, France

Engineer in Mission Control and operational research | *M.Sc. thesis, internship* Sept. 2022 – Feb. 2023
European Space Agency (ESA), Darmstadt, Germany

Research engineer in space telecommunications | *Internship* June 2021 – Sept. 2021
Leanspace SAS, Illkirch-Graffenstaden, France

Engineer assistant of the State Aviation Safety Advisor | *Internship* July 2019
French Internal Affairs Ministry (Ministère de l'Intérieur), Paris, France

Teaching Experiences

ISAE-SUPAERO | *Teaching assistant for graduates* 2023 – now

- **Problem Based Learning — MS — 18h:** Information theory applied to image compression and cryptography.
- **Signal processing — Eng. — 8h:** study of a signal acquisition chain (GNSS, radar).
- **Navigation and perception — Eng. — 13.5h:** experimentations of the GNSS navigation filter with a WLS and EKF based on real GNSS data.

Self-employed | *Private tutoring* 2023 – now

- **Mathematics — undergraduates & graduates — 4 students:** consistent monitoring and intensive training for classes (CPGE), entry examinations (Masters, Engineering schools) and final examinations (Engineering schools).
- **Physics — undergraduates — 2 students:** consistent monitoring in optics, fluid mechanics, thermodynamics, thermal transfers, turbomachines.

Institut Polytechnique des Sciences Avancées (IPSA) | *Tutor for undergraduates* 2019 – 2020

- **Mathematics - CPGE:** Algebra, Analysis
- **Aeronautics - CPGE:** Flight Dynamics

Projects and Extracurricular Achievements (selected)

Fly Your Satellite! #4 | *ESA Educational Program* Winter 2021
Mission: HanseSat

CubeSat mission, lead by students of Hochschule Bremen answering a Call for Proposal by ESA Educational Program. Responsible of the Organisational aspects (management & documentation) of the project and help of the Systems Engineer. Responsible person and active designer of the Telemetry, Tracking and Communications subsystem of the CubeSat.

Aclepios I | *EPFL* 2020–2021
Mission: Analogue space mission (1st mission)

Student association lead by EPFL students and aiming at organizing analogue space mission in tunnels in Swiss Alps. Responsible person for two experiments (standard of operations writing, experiment reports, astronaut training) and the supervision of our Moon rover communication systems.

Open Kaggle Competition | *Titanic – Machine Learning from Disaster* Apr. 2021
Participation in the Titanic Kaggle competition to classify and predict the chance of survival of the Titanic passengers.

Points performed to prepare to the final submission: statistical study of the dataset, filling missing data for some features, ML methods training/testing (logistic regression, K-Nearest Neighbour, Support Vector Machines, Naive Bayes). Final score of 1 (on a scale of 0 to 1). Final rank: 520 out of the 3527 participants (session April 2021)

Personal interests

- **Readings:** Science Fiction, fantasy
- **Sports:** swimming and hiking
- **Music practice (and listening!):** 10 years of piano solo practice and 5 years in a student orchestra and a rock/jazz-band