

Francisco Caldas

Curriculum Vitae

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Address: Av. Estados Unidos da América
nº 113 5 Esq.
1700-170 Lisboa, Portugal
Email: f.caldas@campus.fct.unl.pt

Education and Qualifications

2022-2026	Ph.D. Computer Science	Nova School of Science and Technology
2018-2021	M.Sc. Applied Mathematics (Probabilities and Statistics)	Instituto Superior Técnico
2015-2020	B.Sc. Applied Mathematics and Computation	Instituto Superior Técnico

Scientific Contributions

Publications

1. **Caldas, F.**, C. Soares, C. Nunes, M. Guimarães and R. Ventura (2021), Conjunction Data Messages behave as a Poisson Process. *IJCAI 2021 Workshop on Space Safety*
2. Abay, R., **F. Caldas**, M. Filipe, M. Guimarães. (2021) Benchmarking machine learning models for collision risk prediction in low-earth orbit. *ESA 8th Conference on Space Debris*
3. **Caldas, F.**, C. Soares (2022), A Temporal Fusion Transformer for Long-term Explainable Prediction of Emergency Department Overcrowding, *NeurIPS 2022 Time-series for Health (TS4H) Workshop*
4. **Caldas, F.**, C. Soares (2023), Improving Orbit Prediction in LEO with Machine Learning using Exogenous Variables, *IAC 74'*

International Presentations

- 2020 AI4EU Presentation on the Effects of the Covid-19 Lockdown on Pollution levels in Europe
- 2021 IJCAI workshop AI4Spacecraft Safety - Presentation of the work "Conjunction Data Messages (CDMs) behave as Poisson Process" where a graphical probabilistic model was modeled to predict the arrival time and probability of CDMs close to Time of Closest Approach (TCA)
- 2022 Machine Learning for Health (ML4H'22) Symposium poster presentation on emergency department overcrowding and ML approaches to long-term prediction
- 2023 IAC 74' (74th International Astronautical Conference) presentation on improving orbit prediction in LEO with machine learning using exogenous variables

Working papers under revision or review

1. **Caldas, F.**, M. Vieira, and C. Soares (n.d.). "Evolution of air quality in Europe during COVID-19 lockdowns".
2. **Caldas, F.** and C. Soares (n.d.). "Machine Learning in Orbit Estimation: a Survey".
3. Pereira, M. , Tripa, L., Lima, N., **Caldas, F.** and C. Soares (n.d.). "Advancing Solutions for the Three-Body Problem through Physics-Informed Neural Networks".

Participation in International Projects

- 2020 INSPIRED 2020: "Interstellar Re-factory", Technische Universität Darmstadt (TU Darmstadt) and UNITE.
- 2023-Ongoing Tardis Project: Trustworthy And Resilient Decentralised Intelligence For Edge Systems

Professional activities

Certificates

- 2019 Optimal Stopping Problems and Financial Markets Online Course
- 2020 Agile Leadership
- 2022 ESA's Space Debris Training Course

Professional experience

- 2020-2021 Machine Learning Researcher at Neuraspace