

Ana Filipa Sousa Barros

Filipa Barros is a computer science doctoral student at the University of Porto. Her MSc thesis had the title: Initial Condition Estimation in Flux Tube Simulations using Machine Learning and is expanding a similar theme in her Ph.D. She is also an invited lecturer at the Faculty of Engineering of the University of Porto currently lecturing a data structures and algorithms' class. Her main interests are Machine Learning applicability to space-related problems.

Identification

Personal identification

Full name
Ana Filipa Sousa Barros

Citation names

S. Barros, Filipa

Author identifiers

Ciência ID
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Email addresses

f.barros@fe.up.pt (Professional)

Knowledge fields

Exact Sciences - Computer and Information Sciences

Languages

Language	Speaking	Reading	Writing	Listening	Peer-review
Portuguese (Mother tongue)					
English	Proficiency (C2)	Proficiency (C2)	Proficiency (C2)	Proficiency (C2)	Proficiency (C2)
French	Intermediate (B1)	Intermediate (B1)	Intermediate (B1)	Elementary (A2)	Intermediate (B1)

Education

Degree	Classification
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2021/09/01 - 2025 Ongoing	Doctor's degree in Computer Science (Doutoramento)
	Universidade do Porto Faculdade de Ciências, Portugal
2022/07 - 2022/08 Concluded	Space Studies Program (Outros)
	International Space University, France
2015/09/01 - 2021/07/30 Concluded	Master in Electrical and Computer Engineering (Mestrado integrado)
	Universidade do Porto Faculdade de Engenharia, Portugal
	<i>"Initial Condition Estimation in Flux Tube Simulations using Machine Learning" (THESIS/DISSERTATION)</i>

Outputs

Publications

Book chapter	1	Filipa S.Barros; Vitor Cerqueira; Carlos Soares. "Empirical Study on the Impact of Different Sets of Parameters of Gradient Boosting Algorithms for Time-Series Forecasting with LightGBM". 454-465. Springer International Publishing, 2021. 10.1007/978-3-030-89188-6_34
Conference paper	1	Nuno Costa; Filipa S. Barros; João J. G. Lima; Rui F. Pinto; André Restivo. "Leveraging Physics-Informed Neural Networks as Solar Wind Forecasting Models". 2024. 10.14428/esann/2024.es2024-110
Journal article	1	Filipa S.Barros; Paula Graça; J.J.G. Lima; Rui Ferreira Pinto; Andre Restivo; Murillo Villa. "Using Recurrent Neural Networks to improve initial conditions for a solar wind forecasting model". <i>Engineering Applications of Artificial Intelligence</i> (2024): http://dx.doi.org/10.1016/j.engappai.2024.108266 . 10.1016/j.engappai.2024.108266
Preprint	1	Filipa Barros; João José Graça Lima; Rui F. Pinto; André Restivo. "Neural Networks for Surrogate Models of the Corona and Solar Wind". 2025. https://doi.org/10.5194/egusphere-egu24-420 . 10.5194/egusphere-egu24-420
Report	1	Stein Haaland; Filipa Barros; Lindis Merete Bjoland; Mikkel Breedveld. 2025. <i>Secular shift of the magnetic dip pole and its consequences for auroral boundaries (PoleMotion)</i> . https://zenodo.org/doi/10.5281/zenodo.14425295 . 10.5281/ZENODO.14425295

Thesis /
Dissertation

1

Barros, Filipa. "Initial Condition Estimation in Flux Tube Simulations using Machine Learning". 2021.

Activities

Supervision

	Thesis Title Role	Degree Subject (Type) Institution / Organization
2023/09 - 2024/07	Leveraging Physics-Informed Neural Operators for Solar Weather Modeling Co-supervisor	Informatics and Computing Engineering (Master) Universidade do Porto Faculdade de Engenharia, Portugal
2022/09 - 2023/07	Enhancing ML Models for Solar Weather Forecasting using Clustering and Adversarial Anomaly Detection Co-supervisor	Informatics and Computing Engineering (Master) Universidade do Porto Faculdade de Engenharia, Portugal

Event organisation

	Event name Type of event (Role)	Institution / Organization
2023 - Current	19th European Space Weather Week (ESWW 2023) - Part of the LOC (2023/11/20 - 2024/11/24) Conference (Co-organisator)	

Course / Discipline taught

	Academic session	Degree Subject (Type)	Institution / Organization
2022/02 - 2025/08	Data Structures and Algorithms	electrical and computers' engineering (Licenciatura)	Universidade do Porto Faculdade de Engenharia, Portugal
2021/09 - 2022/02	Computers' Architecture	Electrical and Computer Engineering (Mestrado integrado)	Universidade do Porto Faculdade de Engenharia, Portugal