DAVID MORENO BORRÀS

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EDUCATION

University College Dublin *Sep. 2021 - Present*
Master of Science, Computer Science Dublin, Ireland

Polytechnic University of Catalonia, School of Informatics *Sep. 2015 - Jul. 2019*
Bachelor of Science, Computer Science (Erasmus Mobility: Uppsala University, Sweden) Barcelona, Spain

EXPERIENCE

Institute of Space Studies of Catalonia (IEEC, ICE-CSIC) Sep. 2019 - Sep. 2021
C++ Developer *Barcelona, Spain*

- Developed an **AI scheduling framework** to be used by different ground (*Telescopi Joan Oró (TJO) robotic telescope, Cherenkov Telescope Array (CTA), COLIBRI)* and space (*ARIEL-ESA*) based observatories (C++, Boost, MySQL)
- Set up **Continuous Integration** (using GitLab CI) and **Dockerization** for multiple internal projects and libraries.
- Maintenance of the user website interface used to request observations for the TJO robotic telescope (PHP, Python).

IThinkUPC Feb. 2019 - Aug. 2019
Intern, Full Stack Web Development *Barcelona, Spain*

- Developed a web app with **Java** using Agile methodology and the Spring Framework for one of Spain's major banks.
- Learned and worked with **HTML/CSS/JS/jQuery** for the frontend and **SQL** for the database.

Polytechnic University of Catalonia, Communication Services May 2018 - Aug 2018
Intern *Barcelona, Spain*

- Maintenance of the University's Website (using **Plone**). Developed **Python** scripts to automate routine tasks.

RESEARCH EXPERIENCE

IonSAT UPC Aug. 2019 - Present

- Extending the algorithm developed during my BSc thesis to work in real-time (stellar flare estimation using GNSS data).
- Improving current algorithms and testing new potential methods (e.g. using Machine Learning) for the detection, classification and study of stellar flares.

Peer-Reviewed Publications

- Ariel mission planning. Scheduling the survey of a thousand exoplanets. JC Morales, N Nakhjiri, J Colomé, I Ribas, E García, D Moreno, F Vilardell (2022). Experimental Astronomy. https://arxiv.org/abs/2201.07491

- Real-time detection, location and measurement of geoeffective stellar flares from Global Navigation Satellite System data: new technique and case studies.
Hernández-Pajares, M., Moreno-Borràs, D. (2020). Space Weather, 18. https://doi.org/10.1029/2020SW002441

SKILLS AND INTERESTS

Main languages	C++, C, Java, Python, Fortran
Other languages	C#, MATLAB, Awk, Haskell, Assembly (x86), Prolog, R, LaTeX, SQL, Bash
Tools/Other	Git, Docker, OpenMP, OpenGL, Maven, GitLab, Linux, Windows
Languages	English (TOEFL iBT 114/120), Spanish (Native), Catalan (Native)
Areas of interest/experience	Software Engineering, Artificial Intelligence, Machine Learning, Space research

PROJECTS

Multi-layer Perceptron (Neural Network) https://github.com/mbdavid2/multi-layer-perceptron

Multi-layer Perceptron implemented from scratch in Python using NumPy

Detection of stellar flares using GNSS data https://github.com/mbdavid2/TFG-GNSS

BSc Thesis. Algorithms for the detection of flares from the Sun and far-away stars.

ANTLR4 Compiler https://github.com/mbdavid2/ANTLR4-Compiler

Grammar recognition of a simplified C-language as well as Type Check and Code Generation systems.

Car AI using Genetic Algorithms in Unity https://github.com/mbdavid2/CarsGeneticAI

Cars find the best behavior/parameters to drive in a given track, improving each generation.