DAVID MORENO BORRÀS https://mbdavid2.github.io/dev/

EDUCATION

University College Dublin *Sep. 2021 - Sep. 2022*
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

IonSAT (Ionospheric Determination and Navigation) UPC Research Group January 2024 - Present
Researcher in GNSS (using C++, Python, Fortran) *Barcelona, Spain*

- Developing algorithms for global ionospheric tomography used for precise positioning and space weather estimation.
- Developing a real-time warning system for stellar flares using GNSS data, improving the current framework and testing new potential methods for the detection, classification and study of extra-solar stellar flares.

Microsoft (Office Performance Team) May. 2022 - Jul. 2023
Software Engineer II *Dublin, Ireland*

- Developed and maintained the back-end of the Office Suite (Word, Excel, PowerPoint...), focusing on detecting areas where performance could be improved and implementing solutions following Test Driven Development practices (C++, C#).
- Implemented a Machine Learning anomaly detection real-time pipeline for the detection of faulty frames in app traces, going through the design and development phases of the necessary APIs using Azure services (C++, C#, Python, SQL).

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

- Developed an **AI scheduling framework** used by different ground (*Telescopi Joan Oró (TJO) telescope, Cherenkov Telescope Array, European Southern Observatory, ESO)* 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.
- Maintenance of the University's Website (using **Plone**). Developed **Python** scripts to automate routine tasks.

RESEARCH EXPERIENCE

Peer-Reviewed Publications

- GNSS Solar Astronomy in real-time during more than one solar cycle. Hernández-Pajares, M. et al (2024). https://www.sciencedirect.com/science/article/pii/S0273117723009705
- 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 Hernández-Pajares, M., Moreno-Borràs, D. (2020). Space Weather, 18. https://doi.org/10.1029/2020SW002441

SKILLS AND INTERESTS

Programming languages	C++, C, Java, Python, C#, MATLAB, Awk, Haskell, Prolog, LaTeX, SQL, Bash
Tools/Other	Git, Docker, OpenMP, OpenGL, Maven, GitLab, Linux, Windows
Languages	English (TOEFL iBT 114/120), Spanish (Native), Catalan (Native)

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.