Miguel Callejón Cantero

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Aerospace Software Engineer

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Aerospace Engineering MSc from Delft University of Technology (TUDelft). Very interested in space from both a scientific and technologic point of view, currently working in the Space Situational Awareness (SSA) domain at GMV. Robust programming skills proven by previous experience implementing complex astrodynamic algorithms with a deep mathematical core. Ease to learn and adapt to new technologies and requirements. Strong team-working, assertivity, communication, and drive skills proven by international working environment. Looking for upcoming challenges which can broaden my knowledge and technical expertise.

Skills

Programming	Python (Pip, Numpy, Pandas, Plotly...), Fortran 90, C, C++ (Boost, Eigen, Cmake), JAVA (Spring Boot)
Presentation tools	Office suite, LaTeX, MarkDown, Marp, GIMP
Other technical tools	Jupyter, Visual Studio Code, Git, Linux, Powershell, Gitlab CI, Docker
Communication	Spanish (mother tongue), English (C1, 101/120 TOEFL 23/02/2019, day to day experience)

Technical Experience

ALGORITHMS ENGINEER IN THE SPACE SITUATIONAL AWARENESS (SSA) TEAM **Apr. 2023 — Currently**
GMV *Tres Cantos, Comunidad de Madrid, Spain (Hybrid)*

- Development of astrodynamics C++ library for building and maintaining a space catalogue of objects.
  - Low-level implementation of astrodynamic algorithms in the library, and extensive validation through testing.
  - High-level analysis of the functionality and limitations of the algorithms implemented.
  - Technologies used: C++17 (Boost, Eigen, CMake, Google Tests), Visual Studio Code, GitLab, Agile methodology (SCRUM).
  - International working environment with team members working from Germany, France, and Spain .
- Integration of the cataloguing library infrastructure in the final system:
  - JAVA back-end developer: Swig, Spring Boot, Kafka, Maven, Mockito. PostgreSQL, RESTful API (OpenAPI).
  - Maintenance and improvement of subsystem tests with robot framework.
  - Improvement of Docker structure and GitLab CI pipelines. Grafana monitoring and visualisation of database.

INTERN IN THE SPACE SITUATIONAL AWARENESS (SSA) TEAM **Jun. 2022 — Apr. 2023**
GMV *Tres Cantos, Comunidad de Madrid, Spain (Hybrid)*

- Performing Master's thesis: Assimilation of Swarm C atmospheric density observations into NRLMSISE-00.
  - Literature study on atmospheric density models, and data assimilation approaches.
  - Data assimilation approach to improve the accuracy of density models at several space weather conditions, altitudes, and with several satellite geometries, implemented in Python, and included in C++ library. Analysis of the accuracy improvement.
  - Preliminary results presented in NEO-SST 2 conference.

INTERN IN THE ADVANCED CONCEPTS TEAM (ACT) **Jul. 2020 — Nov. 2020**
European Space Agency (ESA) *Noordwijk, Zuid Holland, The Netherlands (Hybrid)*

- Main task: create and develop optimisation challenges in the web platform optimize.
- Three challenges created: Jupiter Icy Moons Explorer (JUICE) mission design, Traveling Salesman Problem (TSP) based on space debris recovery, and interferometry reconstruction.

Education

Master of Science in Aerospace Engineering **Sep. 2019 — Apr. 2023**
Technical University of Delft (TUDelft) *Delft, Zuid Holland, The Netherlands*

- Specialization: Space Flight, Space Exploration. Key courses: Multi-Disciplinary optimisation, Numerical Astrodynamics, Space Systems Engineering.
- Key projects: Systems requirements analysis of an *asteroid mining mission*. *Shape Design optimisation of an Earth re-entry system* to find the shape with the best compromise between three objectives. Master's thesis at GMV.

Grado en Ingeniería Aeroespacial **Sep. 2015 — Aug. 2019**
School of Aeronautical and Space Engineering (ETSIAE), Technical University of Madrid (UPM) *Madrid, Madrid, Spain*

- Specialization: Aerospace Science and Technology
- Internship in the Department of Applied Mathematics working with Open Source Python framework FEnics and Paraview. Dissertation (Trabajo Fin de Grado, TFG): Implementation of a compressible Navier-Stokes solver using FEnics.

Activities

Formal Education in Music (Piano) at Valladolid Music Conservatory 09 2004 - 07 2014