(+34) 680 98 41 37
Madrid, Comunidad de Madrid, Spain
m.callejon@outlook.com

Miguel Callejón Cantero

Aerospace Software Engineer

GitHub: callejon97
LinkedIn: mcallejon

Aerospace Engineer working in the SSA domain at GMV, MSc from TUDelft. Very interested in space from both a scientific and technologic point of view. Robust software engineering skills proven by previous experience implementing astrodynamic algorithms with a mathematical core, and enhancing the technology to integrate it in a micro-service oriented architecture. 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 to foster technical expertise and contribute to a growing space industry.

Skills

Programming	Python (Pip, Numpy, Pandas, Plotly...), Fortran 90, C, C++ (Boost, Eigen, Cmake), JAVA (Spring Boot)
Presentation tools	Office suite, LaTeX, MarkDown, GIMP
Other technical tools	Jupyter, Visual Studio Code, Git, Linux, Powershell, Gitlab CI, Docker, Grafana, Prometheus
Communication	Spanish (mother tongue), English (C1, fluent)

Technical Experience

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

- Development of C++ astrodynamics library to build and maintain a space catalogue of objects.
  - Low-level implementation of astrodynamic algorithms, 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, Python (pandas, plotly).
- Integration of the cataloguing library infrastructure in the final system:
  - Support with back-end development.
  - Maintenance and improvement of subsystem tests.
  - Creation of performance (stress, load) tests for key processes of the back-end.
  - Integration of a monitoring stack for external components: database, message orquestration, micro-services.
  - Monitoring of the internal system KPI's using scrape agents and monitoring tools.
  - Technologies used: Swig, Spring Boot, Kafka, Maven, Mockito. PostgreSQL, RESTful API (OpenAPI). Robot framework, python, async-profiler. Grafana, prometheus, sql-exporter.
- International working environment with team members working from Germany, France, and Spain.
- Collaboration in the agile methodology (SCRUM), continuously improving organization and technical aspects.

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.