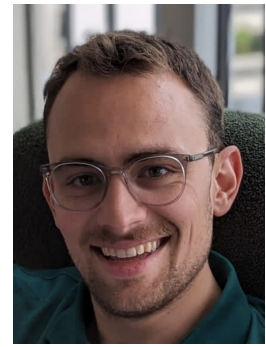


Charles Constant

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🌐 <https://charlesplusc.github.io/>

🌐 <https://www.linkedin.com/in/charles-constant-63364966/>



Education

2022 – Ongoing

📖 PhD Space Flight Dynamics and Geodesy, University College London

- Development and application of a near-real time thermospheric density inversion method for low earth orbiting satellites during geomagnetic storms. (Submitted to *Space Weather* [pre-print](#)).
- Design and Development of a Differentiable Spacecraft Radiation Pressure modelling tool (currently validating).
- Co-developer of the Orbit Domain Calibration Network. In collaboration with Dr. Santosh Bhattarai, supported by UK Satellite Applications Catapult (in preparation for Advances in Space Research. Presented at [COSPAR 2024](#)).
- Co-developer of the MOCAT-Pyssem Source-Sink Evolutionary Model [COSPAR 2024](#)
- Probing Thermospheric Response and Operational Impacts during the 2024 Mother's Day Geomagnetic Storm. In collaboration with UCL Atmospheric Physics Laboratory. (Presenting at European Space Weather Week Nov 2024. Paper in preparation for Space Weather.)
- An Evaluation of Physics Based Force Model Performance in LEO: Implications for Next Generation Space Traffic Management (Presented at [COSPAR 2024](#), paper in preparation for Advances in Space Research.)
- Limitations of Current Practices in Uncooperative Space Surveillance: Analysis of Mega-Constellation Data Time-Series, Presented at [AMOS 2023](#)
- UK Space Agency-International Bilateral Fund Phase 1: UCL-NASA JPL collaboration on radiation pressure modelling for density inversion. Developed interface documents and system design of the interface between GipsyX and the UCL ray-tracing software.
- Peer reviewer for "GPS Solutions" journal
- Assisted in supervising undergraduate and masters research projects.

2021 – 2022

📖 MSc (Merit) Environmental Data Science and Machine Learning, Imperial College London

Dissertation: Aerodynamic Drag Force Modelling on the LEO Mega-Constellation.

Courses: Computational Mathematics, Machine Learning, Advanced Programming.

2018 – 2021

📖 BEng (First-Class) Engineering, University College London



Dissertation: Emotion Detection using Convolutional Neural Networks. *Courses:* Modelling and Analysis, Materials and Fluid Mechanics, Structural Mechanics.

2015 – 2018



📖 BSc (2:1) Physical Geography, University of Reading

Dissertation: Linking Green Spaces to Stress Reduction via Remote Sensing. *Courses:* Remote Sensing, Climatology, GIS.





Experience

- Sep 2023 – Jan 2024  **Researcher**, University College London Consultants Ltd, England.
Research and production of a report for the UK General Lighthouse Authority on the future of PNT technologies over the next 10 years.
- Jun 2023 – Jun 2023  **Navigation Training Course**, European Space Agency Academy, Belgium
Training in GNSS and Galileo system architecture, signal processing, and hands-on navigation exercises.
- Jun 2021 – Sep 2021  **Undergraduate Researcher in Applied Machine Learning**, UCL Civil, Environmental, and Geomatic Engineering, England.
Awarded Departmental Grant to develop and validate methods developed in undergraduate thesis.
- Sep 2020 – Sep 2021  **Founder and Team Lead**, UCL Satellite Design Team, London, England.
Led a team of doctoral and undergraduate students to the final round of the Airbus/UKSEDS CubeSat design competition.
- Jun 2020 – Oct 2020  **Undergraduate Researcher in Astrodynamics**, UCL Space Geodesy and Navigation Laboratory, London, England.
Development of C++ and Python tools for astrodynamics. Characterization and analysis of solar radiation pressure time-series.
- Aug 2019 – Sep 2019  **Land Surveyor**, Murphy Geospatial, London, England.
- Nov 2017 – Jan 2018  **Hydropower Engineering Intern**, Hallidays Hydropower, Abingdon, England.
Led the write-up of a feasibility study for a 35kW Archimedes screw.
- Jun 2017 – Aug 2017  **Assistant Researcher**, Centre de Radiotherapie Hartmann, Paris, France.
Collected patient data for a study on neutropenia.
- Jun 2015 – Jun 2017  **Athlete (semi-professional)**, UK/France/Italy.
Raced in 4 road cycling teams across Europe; Competed in two Ironman events.

Skills

- Coding  Python(advanced), C++(intermediate), C# (beginner); MATLAB(intermediate), Orekit, GMAT, STK, FreeFlyer
- Languages  Bilingual in French and English. B1 certificate in German. Basic Italian.

Awards and Achievements

- 2023  **Best Student Paper Award: Advanced Maui Optical and Space Surveillance Technologies Conference 2023**, Awarded for the paper "[Limitations of Current Practices in Uncooperative Space Surveillance: Analysis of Mega-Constellation Data Time-Series](#)"
- 2021  **Outstanding Research Project Award**, Departmental Award for Dissertation.
-  **Scholarship Committee 3rd year project prize**, Departmental grant to fund furthering of dissertation research over the summer
-  **UCL ChangeMakers Award**, Departmental Award for the for the enhancement of the learning experience of students at UCL