

Joost Hubbard

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Personal Profile

Final-year MEng Aerospace Engineering student with experience in mechanical design, FEA, CFD, and control systems modelling. Leading the mechanical and payload subteam for SOBER, a multinational ESA BEXUS experiment, and the AOCS subteam for a national CubeSat competition. Proficient in SolidWorks, Abaqus, ANSYS, MATLAB, and Python for simulation and numerical modelling. Currently interning at ClearSpace Today as a Simulation Engineer, supporting flight software simulation, embedded systems modelling, and HIL test development. Comfortable working across technical disciplines with a hands-on, analytical approach. Eager to contribute to the development of lightweight, robust, and cost-effective deployable space structures that enable next-generation satellite services.

Skills

Engineering Software SolidWorks, Abaqus, Ansys Mech/Fluent, MATLAB, Simulink, Python, ESA Drama, FreeFlyer, GitHub, Linux.

Technical Skills FEA, CFD, Numerical Simulation, Control Systems Modelling, Attitude Dynamics, LaTeX.

Soft Skills Engineering Documentation, Leadership, Time Management, Teamwork, Presentation, Communication.

Education

Queen Mary University of London

London, UK

MEng in Aerospace Engineering

Sept 2021 - Current

- Graduating July 2025 with first class honours; awarded the Drapers' Company Prize, Principals Prize, and SEMS Prize for 2023/24.
- Completed modules focused on mechanical design, FEA, topology optimisation, vehicle dynamics, and control systems, utilising MATLAB and Python for modelling and simulation.
- Led development of an attitude determination and control system (ADCS) for a CubeSat digital twin in MATLAB, and led both software and hardware of the AOCS for the UKSEDS national CubeSat competition.
- Received the SEED award for significant contribution to QMUL online textbooks on Computational Spacecraft and Symbolic Dynamics, collaborating with Dr Angadh Nanjangud using Git and GitHub version control.

Satellite Applications Learning Hub (SALHUB)

London, UK

Satellite Communications (SatComms), System Engineering, and Market Strategy Training

Feb 2025

- Completed training on space systems engineering, satellite communications, and market strategy, including finance and business planning.
- Developed an understanding of satellite communications system and service design, including regulatory frameworks and standards.
- Engaged in hands-on workshops to define system requirements, design services, and conduct techno-economic analysis.

European Space Agency Academy

ESEC Galaxia, Belgium

Space Debris Training Course 2024

Sept 2024

- Completed training on space debris challenges, covering the current environment, countermeasures, risk assessment, space traffic management, and debris removal, aligned with ESA's Zero Debris initiative for sustainable operations.
- Gained practical experience with ESA's Master and Drama software for satellite modelling and risk analysis.
- Collaborated on a mission planning and risk assessment project focused on the disposal of a Low Earth Orbit (LEO) satellite, ensuring compliance with space debris mitigation guidelines.

Work Experience

ClearSpace Today

London

Simulation Engineer Intern

April 2025 - Present

- Defining and implementing simulation architecture for closed-loop Hardware-in-the-Loop (HIL) testing of spacecraft subsystems.
- Assisting the development of simulation tools for flight software validation, including virtual packet construction and modelling of embedded networking protocols (e.g., CANopen).
- Contributing to the development and maintenance of technical documentation to ensure clarity and traceability.
- Participating in agile workflows and collaborative sprint planning within an international team.
- Technical Skills:** Spacecraft Systems, HIL Simulation, Embedded Networking, Python, Linux, Azure DevOps, Technical Documentation.
- Soft Skills:** Teamwork, Communication, International Collaboration, Agile Development.

BAM UK and Ireland

AWE Burghfield, UK

Trainee Civil Engineer

May 2023 - July 2023

- Developed a detailed project plan and risk assessment for the demobilisation of project components, coordinating between engineering teams and ensuring alignment with project requirements.
- Conducted surveys, completed setting out, ensured quality standards across project areas, introduced to CAD packages like Autodesk Civil 3D and maintained concrete test records.
- Enhanced communication and project integration skills in a fast-paced, high-stakes environment to meet project deadlines.
- Technical Skills:** CAD (Autodesk Civil 3D), Concrete Testing, Surveying, Documentation.
- Soft Skills:** Teamwork, Time Management, Communication.

Projects

Additional materials related to my projects are available on my website.

Design and Implementation of ADCS for the Digital Twin of a CubeSat

Queen Mary University of London

London, UK

Sep 2024 - Current

- Leading the design, simulation, and integration of the Attitude Determination and Control Subsystem (ADCS) for a generic, modular digital twin of a CubeSat, using systems engineering principles to ensure seamless integration with the broader spacecraft model.
- Designing and modelling a quaternion-feedback ADCS in MATLAB/SIMULINK, including the development of sensors, processing algorithms, and actuators while accounting for environmental interactions and disturbances in space.
- Managing a team of five students, planning work-streams, and ensuring progress towards the development of a fully modular CubeSat model.
- **Technical Skills:** Spacecraft Dynamics, Attitude Dynamics, ADCS Design, Quaternion Feedback, System Modelling, MATLAB, SIMULINK.
- **Soft Skills:** Team Leadership, Time Management, Communication, Documentation, Report Writing, Systems Integration.

BEXUS Project SOBER: Payload and Mechanical Engineering Co-Lead & Team Member

Remote

European Space Agency BEXUS Programme

Oct 2024 - Current

- Founding member and co-lead payload and mechanical engineer in an international, multidisciplinary team of over 20 students across 6 countries and institutions, supported by academic and industry partners to create an optical payload for stratospheric flight—aiming to improve space situational awareness in low Earth orbit.
- Successfully passed the Critical Design Review (CDR), demonstrating readiness for detailed design and build phases.
- Led finite element analysis (FEA) for thermal, structural, and vibrational design to ensure robustness and reliability of the payload under stratospheric conditions.
- Key responsibilities include system layout, mechanical design, and simulations to ensure the payload meets stringent performance requirements for the harsh stratospheric environment, as well as developing detailed documentation such as requirement specifications, risk registers, and bills of material.
- Maintaining weekly communication with stakeholders to align design progress with their expectations and project goals.
- **Technical Skills:** Systems Engineering, SolidWorks, Mechanical Design, FEA, Data Analysis, Experiment Design, Documentation.
- **Soft Skills:** Stakeholder Communication, Team Leadership, Time Management, Multidisciplinary Collaboration.

UKSEDS Satellite Design Competition: Lead AOCS Engineer

London, UK

QMSEDS

Oct 2024 - Current

- Working as the lead AOCS engineer at QMSEDS to compete in the UKSEDS satellite design competition which tasks students to design and build a CubeSat to match the competition theme: Rendezvous and Proximity Operations
- Building upon prior designs to create a feedback-loop system integrated with an optical payload for target recognition and tracking.
- My role involves the system and mechanical design as well as the software and control programming.
- **Technical Skills:** Satellite Systems, Control Systems, Systems Engineering Satellite Design, Attitude Dynamics, Orbital Mechanics.
- **Soft Skills:** Time Management, Teamwork, Proposal Writing, Technical Writing.

Finite Element Analysis and Topology Optimisation of Gondola Frame and Shear Bracket

London, UK

Queen Mary University of London

Oct 2024 - Dec 2024

- Modelled a 45x45mm frame section from ESA's BEXUS ESCARGO structure, analysing its ability to withstand payloads up to 15kg.
- Performed mesh convergence analysis in Abaqus to ensure solution accuracy.
- Optimized frame design, reducing material costs by 20% while ensuring structural integrity.
- Conducted a trade-off study of 5 potential construction materials, achieving a 50% reduction in deformation.
- **Technical Skills:** Finite Element Analysis (FEA), Abaqus, Structural Optimization, Mesh Convergence, Materials Selection.
- **Soft Skills:** Analytical Thinking, Problem-Solving, Technical Writing, Data Analysis.

Modelling and Simulation of a Strapped-Down Inertial Measuring Unit (IMU)

London, UK

Queen Mary University of London

Oct 2024 - Dec 2024

- Developing a SIMULINK model of the navigation equations for a strapped-down IMU.
- Simulating error dynamics of the IMU, identifying and predicting errors within the system.
- Creating interfaces for displaying results and producing validation test results to assess the simulator's performance.
- In the process of delivering a report detailing the simulator's design, performance, and validation outcomes.
- **Technical Skills:** Inertial Navigation, SIMULINK, Error Prediction, System Modelling, Flight Dynamics.
- **Soft Skills:** Analytical Thinking, Report Writing, Problem Solving, Presentation.

Computational Spacecraft and Symbolic Dynamics Textbook Documentation

London, UK

Queen Mary University of London

Jun 2024 - Dec 2024

- Working with Dr. Angadh Nanjangud and a team of contributors to document textbooks for two modules taught at QMUL on Computational Spacecraft and Symbolic Dynamics.
- Contributing as both a writer and reviewer for textbook content, ensuring accuracy and clarity in technical explanations.
- Assisting in the research and development of a third textbook focused on variable mass systems.
- **Technical Skills:** Symbolic Dynamics, Spacecraft Dynamics, VMS Dynamics, Python, Jupyter Books, Git, Github, Markdown.
- **Soft Skills:** Time Management, Teamwork, Technical Writing, Attention to Detail.

References available upon request.