JACK TYLER CURRICULUM VITAE

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EDUCATION

MEng Aeronautics and Astronautics/Spacecraft Design, GPA: 87/100 September 2015 - May 2019
University of Southampton, 2nd year

Advanced Levels, 99.98th percentile across the UK September 2013 - June 2015
The Sixth Form College, Solihull

Chemistry, Extended Project Research Qualification (see below),
Further Mathematics, Mathematics, Physics: A*

General Certificate of Education September 2008 - June 2013
Kings' Norton Boys School

Biology, Chemistry, English Language, English Literature, History,
Information Technology, Mathematics, Physics - A*

Design Technology, Spanish - A

EXTRA-CURRICULAR PROJECT EXPERIENCE

Lunar Hopper: Experimental Lunar Lander October 2016 - Present
Lead Engineer
I lead four Engineers through the continuation of the development of a lunar lander that will allow multiple landings and deployment of surface equipment. Whilst such a project is not typically undertaken by students until their 4th year, I lead and participate in fast-paced, concurrent design of control systems, propulsion systems, structures, electronics and the development of software, and ensure the project continues to meet deadlines on-time and under-budget. I provide design analysis, integration testing, and component trade-off evaluations utilising extensive working knowledge of all on-board systems, as well as financial management and project management. The project is carried out in parallel to my studies at the University of Southampton.

ACROBAT: Ballistic Capture Orbit Analysis Tool June 2016 - Present
Author
I designed and wrote a software tool in MATLAB, alongside my studies, that finds and analyses ballistic capture orbits. Given the mass ratio of two primaries, the software locates points in a regularised coordinate system that lead to both ballistic capture and n stable orbits at a specified eccentricity, at the choice of the user. The tool also propagates the behaviour of the capture orbits in an n-body propagation, and optimises the final capture orbits with respect to total ΔV, transfer time, or mission geometry. The project developed extensively skills in MATLAB, numerical methods, optimisation and mathematical modelling. The required knowledge in orbital mechanics, weak stability theory and optimisation to complete the tool is not covered as part of the University of Southampton degree program and was self-taught.

Southampton University Human Powered Submarine September 2015 - Present
Lead Control Systems Engineer, CFD/FEA Tutor
I lead a cohort of 14 Engineers through the design, manufacture and integration of control systems for a human-powered submarine to compete in the International Submarine Races. I undertake and advise on fluid modelling and simulation in Java and C, the development of an active sonar system for tracking, dead-man safety systems, propeller actuation systems and hydrodynamic control surfaces, and ensure that the Control Team delivers the required sub-system in-line with time and finance restrictions. Further, I provide thorough and stringent leadership as part of a critical sub-team, and lead classes on Computational Fluid Dynamics and Finite Element Analysis to 3rd and 4th year students as part of the society, as well as teaching numerical methods and mathematical modelling.

University of Southampton Small Satellite August 2016 - Present
Team Member
I work closely with the leaders of the University's Small Satellite project, UOS^3, to analyse and evaluate assembly design, and create reports that define the manufacture of the satellite during the launch campaign; I was the only 1st year student to have worked on the project, and am currently the only 2nd year student working on the project.

The Impact of Electric Propulsion in the Design and Performance of Spacecraft Submitted June 2014
Research Piece for Extended Project Qualification
I authored a short research piece on electric propulsion before attending University; the piece covers the underlying theory behind electrostatic, electrothermal and electromagnetic propulsion systems, and evaluates design criteria behind both the propulsion and power subsystems, with respect to desired operation modes and orbit manoeuvring requirements. Of particular focus is the impact of electric propulsion on orbital trajectories, with low-thrust co-planar transfers between Earth orbits, as well as the optimisation of low-thrust trans-Martian trajectories featuring as case studies, and incorporates a self-written software tool, designed and written when I was 16, to design trans-Martian trajectories optimised for minimum ΔV.

MATLAB and Simulink Mars Rover Competition April 2016 - May 2016
Software Engineer
I participated in a competition organized and run by Mathworks, to optimize an algorithm used to control a Mars Rover prototype in seeking and interacting with various areas and obstacles. Whilst MATLAB and Simulink are not taught as part of the first-year degree specification, I self-taught new methods and was able to reduce software runtime by 15%.

PLACEMENTS

Electrical Design Engineer Placement Easter 2014
PM Group Engineering, Birmingham Office
I spent Easter of 2014 working at PM Group Engineering, where I undertook the lighting design for an industrial plant for a dairy production company. I integrated seamlessly within a team of 20, and conformed the design to all required standards, safety and design criteria, and created reports and engineering drawings to finalise the project.

WORK EXPERIENCE

Serve Legal May 2016 - Present
I liase with multiple stores and chains to ensure that company and legal policies in selling age-restricted items are followed correctly. The work involves arranging and undertaking store visits to assess performance against client requirements, and creating reports based on store performance to be analysed by the client.

Reduxion Records/United States of Media 2011 - 2015
Music & Media Producer and DJ
I worked alongside the Executive Producer to create ever-changing music and media for customers. Working closely and with good communcation, I liased with local artists and event organisers across the UK, and provided timely and professional music production & DJ services to multiple customers, and worked seamlessly as part of ever-changing teams to deliver high-quality media.

SKILLS

Programming:	Python, Bash, LaTeX, HTML/CSS, C++, C, familiar with FORTRAN
Software:	MATLAB/Simulink, SolidWorks, STK/Astrogator, NASA GMAT, MS Office Suite
Languages:	English (Native), Spanish (Intermediate), French (Basic Working Proficiency)

AWARDS

University of Southampton Merit Scholarship Recipient 2015
Cambridge Chemistry Challenge: Copper Awards 2014, 2015
Kings Norton Boys' Graduation Awards: 7 subject awards, 3 general achievement awards 2012
Matthew Boulton 'Design and Build' Engineering Challenge: Commended 2010
RSC Chemistry Olympiad: Bronze Award 2015
The Maths Challenge Lower Level: Bronze 2013
The Maths Challenge Upper Level: Bronze, Silver 2014, 2015

EXTRA-CURRICULAR ACTIVITIES

Duke of Edinburgh Schemes: Bronze and Silver September 2011 - June 2015
Engineers Without Borders Southampton September 2015 - Present
University of Southampton Sailing Club October 2015 - Present