

Claudio Vestini

+1 (640) 261-5835 | vestiniclaudio@gmail.com | [website](#)

EDUCATION

Princeton University, Mechanical & Aerospace Engineering, Princeton (NJ), US	Aug 2025 – May 2026
• Selected as 1 of 2 from ~30 applicants for competitive final-year exchange program (degree awarded from Oxford)	
Relevant courses (current grade/A):	
• MAE546-Optimal Control: Calculus of Variations, Hamiltonian Systems, Pontryagin's Maximum Principle (A)	
• ORF522-Linear and Nonlinear Optimisation: The Simplex Method, KKT Conditions and Duality, First-Order and Proximal Methods, Operator Theory, Operator Splitting and ADMM, Data-Driven and Robust Optimisation (A)	
• MAE341-Space Flight: Attitude Dynamics, Orbital Mechanics, Space Mission Analysis, Ansys STK (A)	
• PHY321-General Relativity: Special Relativity, Field Equations, Nonrotating Black Holes, Gravitational Waves (A)	
University of Oxford, MEng Engineering Science, Oxford, UK	Oct 2022 – Jun 2026
• Ranked 8 th among all engineering students at the university (top 4%)	
• Achieved First Class Honours (maximum UK grade) in all first-, second-, and third-year exams	
• Keble College Scholar with three consecutive academic college scholarships endorsed by Governing Body	
• Awarded several academic grants, including KCSR118 (second year), EUROP and EPSRC (third year)	
Relevant courses (final grade/100):	
• P1-Mathematics: Linear Algebra, Calculus, Differential Equations, Fourier Analysis, Probability (90)	
• A4-Energy Systems: Thermodynamics, Combustion and Cycles, Incompressible Fluid-Mechanics (88)	
• B5-Solid Mechanics: Elasticity and Plasticity, Statics and Structures, Kinematics and Dynamics, Materials (72)	
• B14-Systems & Information Engineering: Estimation, Inference, Signal and Image Processing, Decision Theory (92)	
• B15-Control Theory: Dynamical Systems, Optimal (LTI) Control, Kalman Filters, Robust Control (73)	
• B19-Fluids: Turbulence and Boundary Layers, Compressible Fluid Mechanics, Supersonic and Hypersonic Flow, Turbomachinery and Chemical Propulsion Devices, Heat Exchangers, Computational Fluid Dynamics (CFD) (88)	
• B20-Machine Learning: Discriminative ML including Support Vector Machines, Perceptrons and Neural Networks, Generative ML including Bayesian Models, Variational Inference, Sampling Methods, Markov Chain Models (69)	
Ferndown Upper School, Sixth Form, Ferndown, UK	Sep 2020 – Jun 2022
• Advanced Level (A-Level): Mathematics (A*), Further Mathematics (A*), Physics (A*)	
• Advanced Subsidiary Level (AS-Level): Mathematics (A), Further Mathematics (A), Physics (A), Computer Science (A)	
• Gold Award for best academic performance in both year 12 and year 13 for Maths, Further Maths and Physics	
• Led school team to first place in the Exeter Mathematics School KS5 Physics Challenge, in a competition of 16 schools	
Liceo Scientifico (High School) Albert Einstein, Rimini, Italy	Sep 2017 – Jun 2020
• <i>Terza Liceo</i> : Twelve 9s/10s, including 9 in Italian and Philosophy, 10 in History, Latin, Maths, Physics, Chemistry	

TECHNOLOGY

Proficient: Linux, Git, Docker, LaTeX (Overleaf), Python (JAX, PyTorch, TensorFlow), MATLAB & Simulink, CAD and FEA3 (SolidWorks), CFD and STK (Ansys), Microsoft Excel, Word, PowerPoint, Google Sheets and Docs **Familiar:** C++, C

RESEARCH EXPERIENCE

Senior Thesis, Princeton University, Princeton, NJ, US	Sep 2025 – Present
(Supervised by Operations Research and Financial Engineering professor Bartolomeo Stellato)	
“Probabilistic Performance Guarantees for Parametric Optimisation Problems via Conformal Prediction”	
• Applying calibration-conditional conformal prediction tools to analyse the performance of first-order methods for linear MPC and image deblurring problems, implementing the solutions in a Python JAX codebase	
Academic Researcher, EPSRC Vacation Internship, Oxford, UK	Jun 2025 – Sep 2025
(Supervised by Oxford Control group professor Kostas Margellos)	
“A Priori Guarantees for Data-Driven Certificate Synthesis”	
• Enhanced a newly developed compression learning algorithm to synthesise certificate functions (barrier, Lyapunov, reach-while-avoid) for nonconvex control problems. Reformulated the algorithm to provide probabilistic guarantees	
• Deployed scenario approach theory bounds, successfully providing a priori risk guarantees for all certificate classes	
• Devised numerical experiments to evaluate the new algorithm on the synthesis and verification of neural certificates using data-driven techniques, implementing the solution within the established FOSSIL framework. The experiments were simulated and validated using Python in a PyTorch environment at the following codebase	

Third-year project (3YP), University of Oxford, Oxford, UK

Oct 2024 – May 2025

(Supervised by Oxford Thermofluids Institute professors Tobias Hermann and Luke Doherty)

“Heatshield Materials Testing during CubeSat Re-Entry with Passive Demise”

- Designed the Model Predictive Attitude Determination and Control (MPC-ADC) system, integrating the logic in MATLAB Simulink using the Model Predictive Control Toolbox
- Developed a custom-made Finite Difference, Forward-Time Centred-Space (FTCS) Thermal Solver in MATLAB to test and analyse the performance of the proposed ablative heat shield
- Created a SolidWorks CAD model for the CubeSat, incorporating the design of the Thermite for Demise (T4D) system
- Executed reacting, compressible, hypersonic CFD simulations in Ansys Fluent to analyse the flow regimes encountered during atmospheric re-entry, using Adaptive Mesh Refinement schemes to capture shockwaves and expansions

Research Internship, Diamond Light Source, Oxfordshire, UK

Aug 2024 – Oct 2024

(Supervised by Oxford Control Group senior research associate Idris Kempf)

“Fast-Forwarding Stalling in Dykstra’s Algorithm”

- Authored my first publication ([available as preprint on arXiv](#)), with pending submission to the 23rd International Federation of Automatic Control (IFAC) World Congress in Busan, South Korea
- Refined the theoretical formulation of Dykstra’s algorithm for projecting onto the intersection of convex sets
- For polyhedral sets, solved an associated stalling problem by formalising the stalling conditions, precomputing the length of the stalling period once the conditions are met, and fast-forwarding the algorithm beyond the stalling phase
- Established a modular Python implementation to implement the proposed algorithm and benchmark against the interior-point solver quadprog, demonstrating linear convergence while guaranteeing reliable projections

TEACHING EXPERIENCE

Lead Tutor, Hilltop Academy, Oxford, UK

Oct 2024 – Aug 2025

- Demonstrated advanced pedagogical skills over 500+ hours of instruction for 70+ students, specialising in STEM subjects including GCSE and IB/A-level Physics, Maths, Further Maths, and Chemistry
- Mentored high-achieving candidates through highly competitive admissions processes, providing targeted preparation for Oxbridge entrance exams (PAT/MAT) and comprehensive interview training
- Incorporated versatile teaching strategies, delivering lessons both online (Zoom, Teams, Meet) and in person, including small-group classes of up to 10 students

Independent Tutor, UK, Italy

Sep 2020 – Aug 2025

- Provided specialised mentorship to students from top UK prep schools (e.g., Eton, Winchester, Westminster), focusing on deep conceptual understanding and problem-solving strategies
- Successfully guided students to achieve high-stakes academic goals, including 90%+ test grades for most students
- Prepared students for elite mathematics and physics competitions, including the British Mathematical Olympiad (Rounds 1 and 2) and the British Physics Olympiad (Rounds 1 and 2)

FURTHER EXPERIENCE

Founder and Chief Engineer, Oxford University Rocketry Society, Oxford, UK

Oct 2024 – Aug 2025

(National Mach25 High-Power Rocketry competition, first participation by University of Oxford students)

- Founded the student project, facilitating the accreditation of the MEng course with the Royal Aeronautical Society; secured sponsorship and over £12k in funding from the Department of Engineering Science, RS Components, Ansys
- Administered a team of 15, promoting collaborative technical development and tight version control standards

Embedded Systems Micro Intern, OxVent, Oxford, UK

Jul 2023 – Aug 2023

(University startup, funded by the UK government, designing easy-to-use ventilators for COVID-19 patients)

- Developed C++ software for a high-grade, low-cost mechanical ventilator, enhancing the user interface; standardised system schematics in a comprehensive Simulink model, resulting in significant efficiency improvements
- Analysed biomedical data trends to inform commercial strategies, supporting a projected 25% profitability increase

President, Oxford University Gliding Club, Oxfordshire, UK

Jun 2024 – Jun 2025

- Organised several club flying days and social events, resulting in over £4,500 in sales for 150+ introductory flights
- Managed and administered club assets, including inspections, maintenance and insurance for the club’s 2 fibreglass gliders (each worth £120,000), ensuring safe and efficient use of the club’s resources for all members

SKILLS & INTERESTS

Languages & Immigration Status: Bilingual English and Italian, fluent Spanish. Pre-Settled Status (UK), F1 visa (US)

Interests: Aviation (pre-solo glider pilot), skiing (Keble College ski Representative), downhill mountain biking, digital photography (Sony A-7iii, DJI drones), visual art (Royal Academy young member, Courtauld friend, explored 120+ galleries worldwide), music and vinyl records, literature (favourite author: F.M. Dostoevsky), travel (visited 32 countries)