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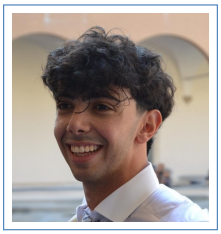

Leonardo Buttà

Personal Summary

PhD student in Aeronautical and Space Engineering with strong interest in flight dynamics, aeroelasticity and structural dynamics. Passionate about aerospace innovation and engineering applications and eager to apply technical skills in a challenging and collaborative environment. Very sociable and open to new experiences.

Academic competences

Strong theoretical and practical background in linear system dynamics and aeroelasticity, with a solid understanding of aircraft structures. Educated in gas dynamics, hypersonic flows, and aeroacoustics, with comprehensive knowledge of air-breathing propulsion systems. Recent academic interests also include nonlinear dynamics, computational fluid dynamics, and aviation safety management and regulatory frameworks.

Education

2023–2025 **Masters Degree in Aeronautical Engineering**, *University of Rome La Sapienza*, Rome
Relevant courses: Aeroelasticity, Flight Dynamics, Aeronautical Structures, Control Systems, Computational Gas Dynamics, Nonlinear Analysis of Structures, Hypersonics, Aviation Regulations and Safety Management

2020–2023 **Bachelors Degree in Aerospace Engineering**, *University of Rome La Sapienza*, Rome, *110 cum laude*

Master thesis

title *Nonlinear aeroelastic analysis of very flexible aircraft using an intrinsic modal approach*

supervisors Prof. Franco Mastroddi, Prof. Francesco Saltari

description Static condensation of a 3D model over a 1D domain is perfomed using Guyan method. Then an existing modal formulation in intrinsic variables of a beam is used to describe the elastic behavior of high aspect ratio wings. Displacements over the whole body are recovered through radial basis function interpolation of nonlinear residuals of displacements, while a Doublet Lattice Method with nonlinear fluid-structure interface is used for aerodynamics. MATLAB is used to perform aeroelastostatic analyses, such as static wind-tunnel simulations and trim analysis, and dynamic analyses such as stability analysis, gust analysis and control-surfaces response.

Bachelor thesis

title *Multidisciplinary design and Analysis of a twin-boom UAV*

supervisors Prof. Renato Paciorri, Prof. Franco Mastroddi, Ing. Andrea Maccapani

description Developed the conceptual design of a twin-boom UAV based on the specifications of an existing aircraft. Aerodynamic performance was assessed through CFD and vortex lattice method simulations, while structural performance was evaluated using finite element analysis and simplified analytical models.

Languages

Italian Fluent *Mother tongue*

English Good

Skills

Programming:	■■■■■	MATLAB	CAE:	■■■■□	NASTRAN
	■■■□□	Wolfram Mathematica		■■■□□	PATRAN
	■■■□□	LaTeX		■■■■□	Tecplot 360
OS:	■■■■□	Windows		■■□□□	Adams
	■□□□□	Linux		■■■■□	CFD++
Simulation:	■■■□□	Simulink		■■■□□	ANSA
				■■■□□	ANSYS Fluent
				■■□□□	Athena Vortex-Lattice

Main academic projects

- **Aeroelasticity assignments**: Completed as part of the *Aeroelasticity* course, this project involved conducting various aeroelastic analyses using both MATLAB and NASTRAN. In MATLAB, I analyzed the pitch-plunge dynamics of an airfoil using Theodorsen's unsteady aerodynamic model, and investigated the panel flutter problem. Using NASTRAN, I carried out multiple analyses on a simplified wing-box model, including static aeroelastic analysis, aeroelastic stability analysis, and gust response simulations.
- **Aeronautical Structures assignments**: As part of the Aeronautical Structures course, I performed a range of structural analyses using NASTRAN, including static, buckling, modal, and frequency response analyses on different geometries.
- **Flight Dynamics group projects**: As part of the *Flight Dynamics* course, I participated in two group projects using MATLAB/Simulink. The first project involved analyzing the flight dynamic characteristics of a fixed-wing aircraft, with a focus on identifying and evaluating key dynamic modes (phugoid, short period, Dutch roll, etc.) and their sensitivity to typical non-dimensional stability derivatives. The project also included some frequency-response analyses to assess the aircraft's handling qualities from an input-output perspective. The second project centered on both off-line and pilot-in-the-loop simulations using the same aircraft model. Additionally, outside the project scope, I independently designed a simple proportional feedback controller to stabilize the aircraft's lateral-directional dynamics, applying basic control system principles.
- **Various Computational Fluid Dynamics Projects**: During the courses *Computational Gas Dynamics*, *Hypersonics*, and *Multidisciplinary Analysis and Design of Aircraft*, I gained hands-on experience with CFD tools such as CFD++ and ANSYS Fluent to perform fluid dynamics simulations across various flow regimes and geometries. These analyses included subsonic, supersonic and hypersonic conditions including reactive flow models. I also utilized industry-standard pre- and post-processing tools, including Tecplot 360, for data visualization and results interpretation.
- **Preliminary design of a mixed-flows turbofan engine**: Developed during the *Aeronautical Engines* course, this project focused on the preliminary design of a turbofan engine based on Eurofighter performance requirements, using Wolfram Mathematica. The work began with a constraint analysis, followed by thermodynamic cycle's parametric analysis and multi-objective optimization. Based on the optimized cycle, I designed the fan and high-pressure compressor stages to meet the required performance. My effort also included the design of a multi-ramp, variable-geometry supersonic intake, along with its off-design performance analysis. Team members were responsible for the turbine and nozzle design, as well as combustion chamber performance analysis.

Interests

- Various music genres
- Playing piano, guitar and drums
- Physics and engineering
- Sports
- Sharing good food and quality moments with friends
- Summer sunsets