GIANNI CASSONI

Aeronautical Engineering & PhD Candidate

CONTACTS
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LANGUAGES
Italian (mother tongue)
English (advance): TOEIC - Grade 945/990 (2019), ESOL International (First), Grade C (2016)
Russian (basic)
Spanish (basic)

WORK EXPERIENCE

Thales Alenia Space & Roma Tre University - PhD Candidate
December 2024 - Present
Developing models of microgravity sloshing for in-orbit refueling and servicing, including semi-analytical formulations for capillary sloshing and a coupled OpenFOAM-MBDyn framework for bubble-impact loads on spacecraft structures. Also supervise thesis students in technical work and research planning.

Politecnico di Milano - Fellow Researcher
July 2022 - Present
Focused on predicting the evolution of the rotorcraft fleet and its movements up to 2050, where I learned the importance of economic factors, market forecasting, and their role in the design phase through market correlations.Collaborated on flutter analysis for the ATTILA (Advanced Testbed for Tiltrotor Aeroelastics) project with Leonardo, NLR and DLR, where I gained experience working with external partners and managing tight schedules on complex numerical models. Contributed to the RPC (Rotorcraft–Pilot Coupling) project by performing data analysis and parameter estimation, developing strong Python skills. Additionally supervised thesis student.

AWARDS & COMPETITIVE FUNDING

ISCRA-C CINECA HPC Allocation 2026
Awarded 100,000 CPU core-hours on Leonardo Data Centric and 10,000 GPU-hours on Leonardo Booster for high-performance computing studies on microgravity sloshing and reduced-order modeling.

EDUCATION

September 2019 - April 2022
Politecnico di Milano**,** Master's degree in aeronautical engineering
September 2016 - September 2019
Politecnico di Milano, Bachelor's degree in aerospace engineering

PUBLICATIONS

Journal Articles

- *Cassoni, G.* Curvature-corrected sloshing spectra for cylindrical tanks in microgravity. Preprint (2026)
- *Cassoni, G., Cocco, A., Tamer, A., Zanoni, A., & Masarati, P.* (2024). Rotorcraft stability analysis using Lyapunov characteristic exponents estimated from multibody dynamics. CEAS Aeronautical Journal, 15(3), 703–719. DOI: 10.1007/s13272-024-00724-y
- *Cassoni, G., Zanoni, A., Tamer, A., & Masarati, P.* (2023). Stability analysis of nonlinear rotating systems using Lyapunov characteristic exponents estimated from multibody dynamics. Journal of Computational and Nonlinear Dynamics, 18(8), 081002. DOI: 10.1115/1.4056591
- *Trevisi, F., Cassoni, G., Gaunaa, M., and Fagiano, L. M.* (2026). Concurrent aerodynamic design of the wing and the turbines of airborne wind energy systems. Wind Energy Science, 11(1), 195-216. DOI: 10.5194/wes-11-195-2026
- De Vita, P., Cassoni, G., Morandini, M., Masarati, P., Fonte, F., Favale, M., & van't Hoff, S. (2026). Numerical interpretation of whirl flutter in a tiltrotor wind-tunnel model using mid-fidelity aerodynamics and mechanical friction. CEAS Aeronautical Journal. DOI: 10.1007/s13272-026-00966-y

Conference Papers & Proceedings

- *Cassoni, G., Serafini, J., Gennari, F., & Masarati, P.* Coupled Fluid-Multibody Simulation of Bubble Impact Loads on Spacecraft. 8th International Conference on Multibody System Dynamics (IMSD 2026), Seville, Spain, June 16-19, 2026.
- *Cassoni, G., Gennari, F., Serafini, J., & Masarati, P.* Curvature-Corrected Sloshing Spectrum via Diffeomorphism of the Zakharov-Craig-Sulem Formulation for Microgravity Applications. 5th International Nonlinear Dynamics Conference (NODYCON 2026), Rome, Italy, September 20-23, 2026.
- *Cassoni, G., Nerattini, A., Colella, A., Gennari, F., Serafini, J., & Masarati, P.* On the CFD Fidelity Requirements for Assessing Classical Slosh Models in On-Orbit Servicing Regimes. ESA GNC & ICATT Conference, Seville, Spain, September 28 - October 2, 2026.
- *Cassoni, G., Madonna, D. P., Colella, A., Gennari, F., Serafini, J., & Masarati, P.* Reduced-Order Modeling of Propellant Sloshing via Differential Variational Inequalities for On-Orbit Refueling Docking Missions. 77th International Astronautical Congress, Antalya, Turkiye, October 5-9, 2026.
- *Van 't Hoff, S., Fonte, F., Velo, A., Masarati, P., & et al.* (2025). ATTILA: Tiltrotor whirl-flutter code-to-test correlation.VFS Forum 81 (2025).
- *Zanoni, A., Cassoni, G., Talamo, C., Marchesoli, D., Zilletti, M., Colombo, F., & Masarati, P.* (2024). An uncertainty propagation approach to collective bounce rotorcraft–pilot couplings analysis. 80th Annual Forum, Vertical Flight Society (2024), pp. 1–12. DOI: 10.4050/F-0080-2024-1321
- *Masarati, P., Cassoni, G., Zanoni, A., & Tamer, A.* (2024). Stability analysis of arbitrarily complex multibody problems using Lyapunov exponents. 3rd International Nonlinear Dynamics Conference (NODYCON 2023), pp. 1–10.
- *Zanoni, A., Marchesoli, D., Talamo, C., Cassoni, G., & Masarati, P.* (2023). Multibody analysis of helicopter pilot biomechanics for real-time end-point impedance estimation. 11th ECCOMAS Thematic Conference on Multibody Dynamics (2023).
- *Cassoni, G., Cocco, A., Tamer, A., Zanoni, A., & Masarati, P.* (2023). Tiltrotor whirl-flutter stability analysis using the maximum Lyapunov characteristic exponent estimated from time series. AIDAA XXVII International Congress (2023), vol. 37, pp. 30–33. DOI: 10.21741/9781644902813-7
- *Cassoni, G., Cocco, A., Tamer, A., Zanoni, A., & Masarati, P.* (2022). Tiltrotor whirl-flutter stability investigation using Lyapunov characteristic exponents and multibody dynamics. 48th European Rotorcraft Forum (ERF 2022), pp. 1–6.
- *Cassoni, G., Zanoni, A., Tamer, A., & Masarati, P.* (2022). Stability of rotorcraft ground resonance by estimating Lyapunov characteristic exponents from multibody dynamics. ASME IDETC/CIE 2022, pp. 1–10. DOI: 10.1115/DETC2022-88995

TECHNICAL SKILLS

Programming & Development: Python, MATLAB, C++, C, Fortran, Julia, Bash, CUDA, LaTeX, REST/GraphQL APIs, and Git, with high-performance computing experience including MPI, parallel computing, and GPU acceleration.
Cloud, Web & Automation: Google Cloud Platform, Docker, Kubernetes, Firebase.
Simulation & Engineering Software: Deal.ii, OpenFOAM (Volume of Fluid, interFoam, capillary flows), MBDyn (flexible multibody dynamics and co-simulation), SU2, SPARTA (hypersonic DSMC), Smilei (Particle-In-Cell plasma simulation), Dakota (optimization and uncertainty quantification), ADAMS, Solid Edge, Inventor, SolidWorks, and Microsoft Office Suite.
LLM & Machine Learning: Local LLM deployment, multi-agent system design, prompt engineering, and application of frameworks including Hugging Face Transformers and Ollama for automation and research workflows.

LEADERSHIP & ACADEMIC REPRESENTATION

february 2025 - Present
Organizing Committee Member, A.I.D.A.A. (Italian Association of Aeronautics and Astronautics)
Elected PhD Student Representative, Roma Tre University