

# Gabriele Immordino, PhD

## Personal Details

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Date of Birth: 08. February 1996  
Nationality: Italian  
Place of Origin: Palermo  
Marital Status: Single



## Education

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- 09/2021 – 10/2025 **Ph.D. in Machine Learning - University of Southampton, United Kingdom**  
In collaboration with Zurich University of Applied Sciences (ZHAW)  
Dissertation: *Data Driven Modelling of Nonlinear Aerodynamics in High Speed Aircraft Using Machine Learning*  
Focus areas: Geometric Deep Learning, Reduced Order Modelling, Bayesian Neural Networks, Data Driven Modelling of Physical Systems
- 10/2017 – 08/2020 **Master of Science in Aerospace Engineering - University of Palermo, Italy**  
Final Grade: 110/110  
Focus areas: Computational Fluid Dynamics, Aerodynamics, Computational Engineering
- 09/2014– 10/2017 **Bachelor of Science in Aerospace Engineering - University of Enna, Italy**  
Final Grade: 110/110

## Professional Experience

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- 09/2025 – 02/2026 **Postdoctoral Researcher / Wissenschaftlicher Mitarbeiter (100%)**  
**ZHAW School of Engineering, IMES Institute for Mechanical Systems, Winterthur**
- Development of RAG based LLM pipelines to support aviation safety assessments and regulatory compliance, including server side Docker containerised architectures with structured document integration, retrieval, and citation controlled answer generation for certification workflows.
  - Implementation of Deep Reinforcement Learning for optimisation of control strategies and trajectories under multi objective constraints.
  - Application of Geometric Deep Learning on unstructured 3D meshes for robust flow field prediction across varying geometries and simulation domains.
  - Collaboration with academic, industrial, and regulatory partners, contribution to research coordination and grant proposals.
  - Contribution to teaching activities and presentation of research results at international conferences.
- 09/2021 – 09/2025 **Ph.D. Researcher/ Wissenschaftlicher Assistent (100%)**  
**University of Southampton in cooperation with ZHAW**
- Development of Machine Learning models for nonlinear aerodynamics in transonic and time dependent flow regimes based on high fidelity CFD data to support analysis and design.

- Design of Reduced Order Models based on Graph Autoencoders, spatio-temporal networks, and Bayesian Neural Networks, with Bayesian optimisation for systematic hyperparameter tuning.
- Integration of multi fidelity datasets to improve generalisation capability, uncertainty quantification, and assessment of prediction reliability.
- Construction, curation, and validation of large CFD and CAE datasets, and development of Python based Machine Learning workflows for training, evaluation, and deployment.

## Research Projects

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<b>Ph.D. Thesis</b> 2021–2025	Data driven modelling of nonlinear aerodynamics using high resolution CFD data, reduced order models with Graph Autoencoders and Bayesian Neural Networks, Bayesian optimization, multi fidelity integration, and Digital Twin development.
<b>SKYSAFE, BAZL</b> 2025–2026	RAG based LLM system for regulatory aviation safety assessments with structured document integration and citation controlled answer generation.
<b>DRACONIAN, BAZL</b> 2024–2025	Deep Reinforcement Learning for optimisation of flight trajectories and control strategies with focus on noise emission reduction.
<b>MODEL SI, EASA</b> 2022–2025	Development of a Digital Twin framework combining physics based simulation and data driven models to support safety relevant assessment processes.
<b>MDO, Pilatus Aircraft</b> 2022–2023	Implementation of aerodynamic optimisation workflows based on high fidelity simulations and sensitivity analyses to improve efficiency and robustness.

## IT-Skills

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Programming Languages	Python ( <i>Expert</i> ), MATLAB ( <i>Advanced</i> )
ML Frameworks	PyTorch ( <i>Expert</i> ), TensorFlow ( <i>Expert</i> ), Hugging Face ( <i>Advanced</i> )
CFD and CAE/CAD	SU2 ( <i>Expert</i> ), Ansys ( <i>Advanced</i> ), SolidWorks ( <i>Advanced</i> ), Pointwise ( <i>Advanced</i> )
Varia	Docker ( <i>Intermediate</i> ), AWS Cloud ( <i>Intermediate</i> ), HPC environments ( <i>Intermediate</i> ), Slurm ( <i>Intermediate</i> ), MPI ( <i>Intermediate</i> ), Git ( <i>Advanced</i> ), LaTeX ( <i>Expert</i> ), MS Office ( <i>Advanced</i> )

## Languages

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English	Professional proficiency (C1)
Italian	Native speaker (C2)
German	Basic knowledge (A2) - currently improving

## Interests

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World Travel	Regular international travel with focus on cultural exchange
Fine Arts and Museums	Interest in modern and contemporary art
Sports	Endurance and outdoor activities
Japanese Culture	Interest in history, aesthetics, and society

## References

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Available upon request