Stefano Guidolotti

Stefano is an aerospace engineer with a strong passion for math and science.
His research interests gravitate around the world of high-performance engineering
with a particular focus on propulsion and turbomachinery.
Offers well-developed analytical skills and excellent teamwork abilities.

Experience

10/2022 – 06/2023 **Research Master**, *von Karman Institute for Fluid Dynamics (VKI)*, Brussels.

Research activity in the Turbomachinery and Propulsion Department.
The Scientific Advisory Committee (SAC) is established by NATO-STO.

Research Project: Gradient-based aeroacoustic optimization of NASA Rotor37.
- RANS simulations on a highly loaded transonic axial compressor (modeled and parameterized);
- Developed a post-processing tool for modal decomposition of CFD results;
- Performed and implemented adjoint gradient-based multi-objective 3D shape optimization.

Modules: Aerothermodynamics, Advanced Compressor Design, Aeroacoustics
Computational Fluid Dynamics, Measurement Techniques, Multidisciplinary Optimization

11/2021 – 10/2022 **Propulsion Engineer - Research Fellow**, *University of Pisa*, Pisa.

Research activity in the Chemical Propulsion Laboratory (Aerospace Department).
Performed dynamic characterization of inertially and thermally cavitating inducers.

Research Project: Flow instabilities in liquid rocket engine turbopump inducers.
- Applied a model-based approach for pressure perturbations predictions;
- Designed a Bayesian estimator for theoretical and experimental spectra;
- Designed an instability identificator by means of MLE.

Preprint:
- Maximum Likelihood Identification of Backflow Vortex Instability in Rocket Engine Inducers, Guidolotti S. and d'Agostino L., ASME Journal of fluids engineering, https://doi.org/10.1115/1.4063695

Supervised students:
- Ruiz López Álvaro, Universitat Politècnica de València.
  M.Sc. thesis: Parametric Identification of Backflow Vortex Instability: A Comparative Study.
- Hooshyar Mozhdeh, University of Pisa.
  M.Sc. thesis: Bayesian Identification of Cavitation-induced Instabilities in a 4-bladed Axial Inducer.

09/2021 – 10/2022 **Freelance Account Manager**, *Poincaré Podcast*.

Managed an interview-based podcast about research.

Publication:
- Interplay between chaos and stochasticity in celestial mechanics, Manzi M., Guidolotti S. and Petrini M., JuliaCon 2022, https://doi.org/10.13140/RG.2.2.31335.11685

09/2020 – 02/2021 **Academic Tutor**, *University of Pisa*, Pisa.

Tutoring and supplementary teaching activities for aerospace engineering freshmen.

Relevant Projects

VKI
- Development of a CFD post-processing tool for mass-momentum-energy averaging of non-uniform flows;
- Mesh dependency study of a supersonic compressor cascade (AGARD);
- Design of a five-hole pressure probe for wake losses measurements on a high turning compressor cascade.

University of Pisa
- Backflow vortex instability identification in rocket engine inducers;
- Euclid: payload and service module structural analysis;
- Pre-Phase A design of a microsatellites constellation for global ship monitoring.

Education

02/2019 – 11/2021 **M.Sc. in Space Engineering**, *University of Pisa*, Grade: 110/110 cum laude.
Modules: Control Theory, Remote Sensing, Rocket Propulsion, Space Systems
Spacecraft Structures, Spaceflight Mechanics, Thermal-Fluid Sciences

09/2019 **Ladybird Guide to Spacecraft Operations**, *ESA Academy Training Course*.
The course focused on satellite operations, the systems involved (e.g. AOCS, Propulsion) and the common problems occurring during spaceflight.

09/2015 – 02/2019 **B.Sc. in Aerospace Engineering**, *University of Pisa*, Grade: 104/110.
Final Report: Compressible flow through convergent–divergent nozzles.

Languages

Italian Mother tongue

English

Understanding		Speaking		Writing
Listening	Reading	Spoken Interaction	Spoken Production	
C1	C1	B2	B2	B2

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user (CEF)

Digital Skills

Programming **Advanced**: MATLAB **Intermediate**: Git, Python, C++ **Basic**: Java, Julia, Shell Scripting

Engineering **Advanced**: SOLIDWORKS **Intermediate**: CATIA, STAR-CCM+, Ansys Workbench, Tecplot ParaView, CADO (VKI), STK, Simulink, Autodesk Inventor **Basic**: NASTRAN, SNAP (ESA) REFPROP (NIST), XFOIL

Other **Advanced**: LaTeX, Microsoft Office **Basic**: Microsoft Project, Project Libre

OS macOS, Linux, Windows

Additional Information

Certifications & Experiences
AGI Systems Tool Kit – *Level 1, Level 2 ongoing*
University of Pisa, MSC Software Italy – *An Introduction to Implicit Nonlinear Analysis*
MathWorks – *Self-paced courses*

University of Pisa, INFN, Fermilab – *Fermilab 2021 Summer Student School partecipation*
ASI, University of Cagliari – *SDSA 2019 partecipation*

Driving License B

I hereby authorize the use of my personal data in accordance to the GDPR 679/16 - "European regulation on the protection of personal data".