

**PERSONAL
INFORMATION****ERNESTO SOZIO***Turbine Aerodynamic Engineer***SUMMARY**

Turbine Aerodynamic Engineer with in-depth experience in Computational Fluid Dynamics, and gas turbine design and optimization for industrial, jet engines, and rocket applications, who lived and worked in 4 countries over the last 12 years. Recognized for his strong expertise in the field of turbomachinery aerodynamics, with very good technical and analytical skills, always prone to learn and improve new aero design methodologies. Author of 3 patents and a paper in the field of gas turbine aerodynamics for aviation applications and awarded multiple times for his exceptional performance displayed at work. Strongly results-driven and creative problem solver, well able to work under pressure and capable of delivering on time and quality. Team player naturally fitting into international and multicultural environments, with an extrovert personality promoting an inclusive workplace.

**WORK
EXPERIENCE****02/05/2022 - PRESENT****Turbomachinery Fluid Dynamics Engineer****Pangea Aerospace, Propulsion Department.**

Barcelona, SPAIN.

Main activities and responsibilities:

- Leader of the aerodynamic design of supersonic turbines for Liquid Rocket Engine (LRE) applications.
- Supervisor of all the fluid dynamics design activities related to the LRE turbomachinery design, including inducers and centrifugal pumps.
- Responsible for the turbopump test stand designs.
- Coordinator of the aerodynamic design methodology for aerospike engines.
- Leader of the Aerodynamic Technical Community, and responsible for the company design practices and standardization of all the aerodynamic design methodologies for turbopumps and aerospike engines.

Business or sector: Space – R&D Execution.**01/02/2016 – 30/04/2022****Turbine Aerodynamic Lead Engineer****GE – Avio S.r.l., Advanced Technology Operations (ATO) Department.**

Rivalta di Torino, ITALY.

Main activities and responsibilities:

- Member of the aero design team of GE Avio Aero very first High Pressure Turbine (HPT) for business and general aviation turboprop market (GE-Catalyst), and

- responsible for the related Vane-1 cooled Flow Function tests.
- Focal for Aerodynamic preliminary design exploration of innovative Low Pressure Turbines (LPTs), aiming at providing disruptive configurations to identify next generation commercial aviation LPT architectures for narrow body aircraft.
- Aero focal for the GENx 1B/2B service (the GE engines that power the Boeing 787 Dreamliner and Boeing 747-8 aircraft) to support non-conformance evaluations, cost out activities, producibility improvements, and field issues.
- Aero focal for several Turbine Rear Frames (TRFs) aerodynamic design, and responsible for the GE-Affinity TRF.
- Authorship of GE Aviation Design Practice: “Turbine Airfoil Design”.
- Main author and co-author of 3 patents filed, contributing to IP strategy for GE Aviation competitive advantage.
- Involved in cascade test activities to validate advanced aerodynamic design features.
- Global Turbine Aero Tech Community focal point for GE Avio Aero.

Business or sector: Aviation – R&D Execution.

01/02/2015 – 31/12/2015 **Turbine Aerodynamic Design and Performance Engineer**
ALSTOM (Switzerland) LTD. Gas Turbine Integration Department (GSTRT).
 Baden, SWITZERLAND.

Main activities and responsibilities:

- Responsible for validation and analysis of industrial diffusers performance field data, and definition of the related boundary conditions for CFD calculations at different load cases.
- Sensitivity studies for mesh sizes and turbulence models.

Business or sector: Industrial Gas Turbine – R&D Execution.

15/10/2012 – 31/01/2015 **Development Engineer Thermals**
ALSTOM (Switzerland) LTD. Gas Turbine Integration Department (GSTRD).
 Baden, SWITZERLAND.

Main activities and responsibilities:

- Thermal analysis by means of Rolls-Royce aero-engine technology (SC03) for the calculation of engine component temperatures to support mechanical design and lifetime assessments.
- Interaction with other technical units for the creation of the thermal Whole Engine Model (WEM) of the full engine.
- Unsteady CFD calculations.
- Coupling fluid (CFD) and structural (FE) models.

Business or sector: Industrial Gas Turbine – R&D Execution.

26/09/2011 – 26/10/2011 **Mechanical engineer**
POLITECNICO DI BARI, faculty of Mechanical Engineering.
 Bari, ITALY.

Main activities and responsibilities: Development of an algorithm for calculating velocities and streamlines on a blade-to-blade stream surface of a turbomachinery.

Business or sector: Computational Fluid Dynamics.

SKILLS

NATIVE LANGUAGE ITALIAN

**OTHER
LANGUAGES**

ENGLISH

SPANISH

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Interaction	Production	
C2	C2	C2	C2	C2
A2	A2	A2	A2	A1

GERMAN

A1	A1	A1	A1	A1
Levels: A1/2 = Basic user	– B1/2 = Independent user	– C1/2 = Proficient user		
<u>Common European Framework of Reference for Languages</u>				

COMPUTER SKILLS

- **O/S:** Windows, LINUX.
- **Other:** Microsoft Office programs (Word, Excel and PowerPoint).
- **Programming:** Visual Basic, Matlab, Fortran, Python.
- **CAD:** Siemens NX.
- **Others:** Fluent, Ansys CFX, AxSTREAM, Numeca, Tecplot 360, SC03, and all the GE-Avio in-house Aero design programs and CFD analysis.

EDUCATION AND QUALIFICATIONS**03/10/2011 – 21/09/2012****Post-Graduate Research Master in Fluid Dynamics – Turbomachinery and Propulsion Department (turbine specialization)**

VON KARMAN INSTITUTE FOR FLUID DYNAMICS.

Rhode-St-Genèse, BELGIUM.

Project title: “Design-Optimization Process of Innovative Axial Turbines” (*Paper presented and published at ASME Turbo Expo 2013, San Antonio, Texas, USA.*)**Graduation mark:** **HONOURS.****Main subjects:** Differential equations of Fluid Dynamics – Numerical methods in Fluid Dynamics – Flow in Turbomachinery – Advanced course on Turbines.**27/04/2011****MSc in Mechanical Engineering, curriculum of machinery and propulsion**

POLITECNICO DI BARI, faculty of Mechanical Engineering.

Bari, ITALY.

Thesis title: “Analysis of wall models for turbulent flow simulation”.**Graduation mark:** **110/110 CUM LAUDE.****Main subjects:** Fluid machinery – Turbomachinery – Computational Fluid Dynamics – Aerospace propulsion – Gas dynamics – Turbulence – Modelling and simulation of power plants – Internal combustion engines – Hydraulics.**15/02/2007****BSc in Mechanical Engineering**

POLITECNICO DI BARI, faculty of Mechanical Engineering.

Bari, ITALY.

Thesis title: “Simulation of the flow in a centrifugal pump”.**Graduation mark:** **101/110.****Main subjects:** Thermodynamics and heat transfer – Fluid dynamics – Rational mechanics and applied mechanics – Mechanical behaviour of materials and mechanical design – Manufacturing engineering and technology.**ACHIEVEMENTS****06/09/2022****US Patent Application Granted****E. Sozio**, F. Bertini, J.D. Clements, J. Ong, L.D. Dailey, P.H. Vitt, M.R. Usseglio. “*Turbine Engine With Airfoil Having High Acceleration And Low Blade Turning*”.

Pub. No.: US 11,434,765 B2. Appl. No.: 17/148,635

31/03/2022**US Patent Application Publication**M. Airaud, P. Calza, F. Bertini, M.R. Usseglio, C. Lizzer, **E. Sozio**, M. Furfaro, M. Thiene. “*Turbine Blades Including Aero - Brake Features And Methods For Using The Same*”.

Pub. No.: US 2022/0098987 A1. Appl. No.: 17/388,143

16/12/2021**GE Impact Award**Reason: “*Congratulations and thank you for your authorship of GE Aviation Design Practice ‘Turbine Airfoil Design’. On behalf of the DB4 Leadership Team and Chief Engineer's Office, I*

thank you for your efforts, dedication, and expertise in writing this Design Practice. This DP not only documents your knowledge and the knowledge of our business but allows us to pass it and leverage on for productive use in the future for the benefit of our customers and our business."

09/12/2021 US Patent Application Publication

A. Buonavino, L. Giacobone, D. Coutandin, **E. Sozio**, F. Bertini. *"Turbine Engine Component With A Set Of Deflectors"*.

Pub. No.: US 2021/0381389 A1. Appl. No.: 17/228,778

12/12/2018 GE Impact Award

Reason: *"The innovative LPT architecture tested will enable a leap in efficiency, product cost and engine accessibility, representing one of the key systems for next generation narrow body engines. [...] The team succeeded in designing, procuring, and testing two different sub-scale turbines configurations with a FastWorks approach, in a global collaborative environment."*

06/09/2016 GE Bronze Award

Reason: *"Deliver results in an uncertain world. The ATP GGT is the first aero design of an HPT for a NPI program done in AvioAero and in general in GEA, outside US. The aerodynamic design team successfully completed the aero reviews and made an impressive amount of work in a very short term to come out with successful design in a context where the engine definition is still evolving, requiring continuous loops and iteration to optimize the design. [...] A significant demonstration of systems mindset by the team."*

05/06/2013 Paper presented and published at ASME Conference

E. Sozio, T. Verstraete, G. Paniagua. *"Design-Optimization Approach to Multistage Axial Contra-Rotating Turbines"*. Proceedings of ASME Turbo Expo 2013. GT2013-94762. San Antonio, Texas, USA.

DOI: 10.1115/GT2013-94762.

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