

Curriculum Vitæ – Guilherme Siqueira de Aquino

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Born on March, 11 1997 in Vitória, Brazil.

EDUCATION

Ph.D. candidate (October 2023 - September 2026) – Université de Toulouse working at Institut de Mécanique des Fluides de Toulouse (IMFT), France.

- Working with vortex ring and particle interactions using numerical and experimental approaches.
- Supervisors: Dr. Julie Albagnac and Dr. Sylvain Viroulet.

Mechanical Engineer (February 2018 - July 2023) – Federal University of Espírito Santo (Ufes), Brazil.

- Five-year program; Overall GPA 9.07 of 10 (top 1% of the program).
- Teaching Assistant for Multivariable Calculus (one-year).

High School and Technician in Industrial Automation Degree (February 2013 - December 2016) – Federal Institute of Espírito Santo (Ifes), Brazil.

RESEARCH EXPERIENCE

Graduate Research Assistant – Eindhoven University of Technology, the Netherlands (June 2025 – August 2025)

- Investigating the influence of lateral confinement on regime transitions in stratified inclined duct flows through numerical simulations and analytical modeling. Supervisor: Dr. Matias Duran-Matute.

Intern – Global R&D ArcelorMittal, Brazil (September 2022 – June 2023)

- Performed machine learning technics to predict wear locating in industrial ventilation systems.
- Developed CFD analysis in the environmental area focusing on improving industrial ventilation systems.
- Supervisor: Dr. Rafael Sartim.

Undergraduate research – Laboratory for Computational Transport Phenomena (LFTC-Ufes), Brazil. (June 2022 – July 2023)

Effect of excessive mesh refinement in internal turbulent flows using RANS approach

- Evaluated the relationship of various mesh refinement levels (\bar{y}^+ from 0.1 to 200), turbulence models, and wall functions to verify the influence of the spatial discretization in the models.
- Applied statistical tools to compare numerical results to experiments in different scenarios, varying pipe configurations.
- Supervisors: Dr. Ramon Silva Martins and Dr. Márcio Ferreira Martins.

Undergraduate research – Research Group for Oil and Gas Flow and Measurement (NEMOG-Ufes), Brazil. (March 2020 – June 2022)

Influence of numerical simulation parameters on the numerically calculated profile factor of ultrasonic flow meters.

- Verified the non-inhomogeneity in velocity profile caused by installation effects.

- Post-processed the data of simulations via MatLab and Python, to calculate the ultrasonic flow meter profile factor.
- Supervisors: Dr. Ramon Silva Martins and Dr. Rogério Ramos.

PUBLICATIONS IN PEER-REVIEWED JOURNALS

MARTINS, R S; **DE AQUINO, G S**; MARTINS, M F; RAMOS, R. Sensitivity analysis for numerical simulations of disturbed flows aiming ultrasonic flow measurement. **Measurement (IF 5.6 — Q1)**, 2021.
doi.org/10.1016/j.measurement.2021.110015

MARTINS, R S; **DE AQUINO, G S**; COELHO, É P; GOUVEIA, G L O de. Realistic designs of windows and doors as solutions to improve natural ventilation in hot-humid climates: a factorial design approach. **Architectural Engineering and Design Management (IF 2.5 — Q1)**, 2024.
doi.org/10.1080/17452007.2024.2374766

DE AQUINO, G S; MARTINS, R S ; MARTINS, M F; RAMOS, R Statistical considerations on RANS simulations of inhomogeneous pipe flows. **Journal of the Brazilian Society of Mechanical Sciences and Engineering (IF 2.1 — Q2)**, 2025.
doi.org/10.1007/s40430-024-05365-0

DE AQUINO, G S; MARTINS, R S ; MARTINS, M F; RAMOS, R An Overview of Computational Fluid Dynamics as a Tool to Support Ultrasonic Flow Measurements. **Metrology (IF 1.5 — Q2)**, 2025.
doi.org/10.3390/metrology5010011

Direct result from the thesis:

DE AQUINO, G S; VIROULET, S; SASSO, N; ALBAGNAC, J. Interaction regimes of a vortex ring and an inertial particle. **Journal of Fluid Mechanics (IF 3.9 — Q1)**, 2025.
doi.org/10.1017/jfm.2025.10909

KNOWLEDGE DIFFUSION

DE AQUINO, G S; VIROULET, S.; ALBAGNAC, J. When a vortex ring meets a particle... **77th Annual Meeting of the Division of Fluid Dynamics**. American Physical Society – Utah, Salt Lake City, Usa. November 24-26 2024.

DE AQUINO, G. S.; VIROULET, S.; ALBAGNAC, J. Interaction of a vortex ring with inertial particle(s) **International Conference on Multiphase Flow**. May 2025.

RESEARCH GRANT

International mobility grant from Université Toulouse: 1717 €, 2025.

International mobility grant from Institut National Polytechnique de Toulouse: 1500 €, 2025.

Scholarship for PhD: 3 years funding, 2023 - 2026.

LANGUAGE

Portuguese (native speaker), English (advanced), French (intermediary)

SKILLS AND SOFTWARE

LaTeX, Python, C++, MATLAB, 3D modeling, CFD software (ANSYS Fluent, OpenFOAM, and Basilisk), high-performance simulations, Experimental Methods (PIV, shadowgraphy, and machine vision)