

Personal Summary

MSCA PhD candidate in Chemical Engineering with a background in Simulation Sciences and Mechanical Engineering, specializing in computational modeling of multiphase and reactive flows. Strong experience in CFD, numerical methods, and scientific programming, with hands-on work in high-fidelity simulations of fluid mechanics, heat and mass transfer, and multiphysics systems. Proficient in C++, Python, and MATLAB for scientific computing and workflow automation. Interested in droplet-scale evaporation and combustion modeling for low-carbon e-fuels and sustainable energy applications.

Experience

MSCA PhD Candidate | Politecnico di Milano | Milano, Italy

December 2025 – Present

- Numerical modeling of droplet evaporation and combustion for liquid carbon e-fuels using detailed thermodynamics and chemical kinetics
- Application of OpenSMOKE++ to 0D reactor simulations and 1D droplet configurations

Product Management Intern | Siemens Digital Industries Software | Köln, Germany

February 2024 – August 2024

- Created technical documentation and best-practices presentation (190+ uses) to enhance user adoption of simulation tools, collaborating with the developers of the software and with my supervising product manager
- Developed advanced computational fluid dynamics (CFD) simulations with STAR-CCM+ and technical content including animations, high-quality renderings, and visualizations to enhance user understanding of CFD and post-processing workflows
- Maintained a structured workflow, delivering the first version of the documentation on schedule for the software's new (version 2406) release

Master Thesis Student | Forschungszentrum Jülich | Jülich, Germany

October 2023 – February 2024

- Developed a C++ numerical modeling algorithm to retrieve atmospheric gravity waves
- Improved the localization of the retrieval algorithm by utilizing continuous wavelet transform
- Designed custom Python functions for reading/writing NetCDF files and exposed them to the C++ code with Boost.Python
- Validated the new retrieval method using synthetic datasets, demonstrating improvements in detecting transient atmospheric structures
- Worked in a Linux-based development environment, improving code efficiency and performance
- Integrated algorithms into existing computational frameworks

- Led the fuel systems team in designing and developing the Very Light Aircraft (VLA) fuel system from concept to simulation
- Developed 3D multiphase CFD simulations of fuel tanks with ANSYS Fluent using Volume of Fluid (VOF) method to analyze sloshing behavior, and finalized the tank design ensuring the fuel pump remains submerged and operational
- Designed and optimized the first iteration of the fuel system using Amesim and created technical drawings with CATIA
- Coordinated with cross-functional teams, updating the fuel system to align with overall aircraft design
- Created roadmaps and schedules, ensuring efficient project management and milestone completion
- Prepared and presented the Preliminary Design Review (PDR) report, ensuring alignment with engineering standards and project milestones

- Prepared CAD drawings for spare parts for work machines and automobiles using SolidWorks
- Prepared and organized files, spreadsheets, and reports using MS Office tools

Education

Skills

- CFD (ANSYS Fluent, STAR-CCM+, OpenFOAM)
- OpenSMOKE++, Cantera
- Grid Generation & Meshing
- Finite Element Method (FEM)
- Programming (C/C++, Python, MATLAB)
- Reactive Flow Simulation
- Fluid Dynamics & Aerodynamics
- Heat Transfer & Thermodynamics
- Turbulence Modeling & Multiphase Flows
- Atmospheric Physics & Gravity Waves
- Adaptability
- Problem-Solving
- Teamwork & Collaboration
- Project Management
- Communication