

Raffaele BELLINI

PERSONAL DATA

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WORK EXPERIENCE

JUNE 2019 - FEB. 2020 | Project Engineer - Graduate at **Wood PLC**, Corsico, Milano, Italy.
My responsibilities are to support the Project Manager in coordinating the Engineers, organize meetings with international clients and provide the members of the projects with the lists of activities. I am involved in one project in Romania and one in UAE.

JUNE 2018 - APRIL 2019 | Research Project at **SPLab** at Politecnico di Milano
My work consisted in the development and validation of new density-based solver able to simulate the behavior of liquid Aluminum Oxide particles inside a Solid Rocket Motor's combustion chamber at different pressures and temperatures (the thermophysical properties of Al_2O_3 were also added in OpenFOAM's libraries). The development of the project was divided into two operative phases: the numerical simulation and the experimental validation. In particular, I created this new solver starting from a density-based solver (rhoCentralFoam) coupling the eulerian gas phase description to a Lagrangian particle tracking by means of already existing and to-be-implemented libraries. At the end of this work I gained experience on the mesh parametric analysis, turbulence models, C++ and Python languages, multiphase flows, OpenFOAM and post-processing analysis.

APRIL - JULY 2016 | Internship at **Brembo S.p.A.**, Curno, Bergamo, Italy
Performance-Racing intern
I worked as an intern on the development of an algorithm able to estimate the rigidity of a calliper in relation to its weight for Formula 1, Rally, NASCAR and other competition vehicles. I analyzed the relations and the forces between wheels and asphalt, and how the pressure to the brake fluid influences the rigidity of the calliper. I used Catia to analyze forces, deformation, strain and stress of all the components of the calliper (through the FEM Analysis), Microsoft office Excel (VBA) and Matlab to develop the algorithm.

EDUCATION

FEB. 2020 - PRESENT | PhD in MECHANICAL AND AERONAUTICAL ENGINEERING, **City, University of London**, London, United Kingdom
Project Title: "DNS for collapsing bubble dynamics and surface erosion for fuel mixtures"
Supervisors: Prof. Manolis GAVAISES and Foivos KOUKOUVINIS.
This PhD is part of the EDEM Project, a Marie Skłodowska-Curie European Industrial Doctorate (EID) network, funded by the EU.

OCT. 2016 - APR. 2019 | Master of Science in AERONAUTICAL ENGINEERING, **Politecnico di Milano**, Milan, Italy - Major: Aerodynamics and Propulsion
Thesis: "Aluminum Agglomerates in the Core Flow of a Windowed Rocket: Simulation and Experimental Characterization" | Advisor: Prof. Filippo MAGGI.
Final Grade: 110/110 - Top 5%

SPRING 2018 | Exchange Program at **Tomsk Polytechnic University**, Tomsk, Russia
At TPU, I studied on Finance, Material, Nuclear engineering and Russian Language.
GPA 4/4 - Top 1%

OCT. 2012 - JULY 2016 | Undergraduate Degree in MECHANICAL ENGINEERING, **Politecnico di Milano**, Milan, Italy
Major: Ground Vehicles
Thesis: "Calcolo Stima Assorbimento, Pinza Freno" | Advisor: Prof. M. GOBBI

MAIN PROJECTS

- JUNE - JULY 2018 | **High Pressure Turbine Design**
The goal was to design a multistage steam turbine that accomplishes a pressure drop given the initial pressure, temperature and mass flow rate. A further request was to design the blades for both rotor and stator by using Constant Flow Angle and Free Vortex Method. The software used were Matlab and Ansys.
- OCT - DEC. 2016 | **Experimental and Computational study of single and tandem airfoils**
This project consisted of both numerical and experimental aerodynamic analysis. In the computational part, the Hess-Smith panel method was implemented in Matlab in order to simulate the incompressible potential flow over a single and two tandem airfoils. In the experimental part, the same problem was studied in a wind tunnel measuring the values of the aerodynamic quantities. The purpose was to check the correctness of the mathematical model and to discuss the differences between the model and reality.
- OCT. - DEC. 2017 | **3D combustor Fluid Dynamics analysis based on OpenFOAM**
During the course *Computational Techniques for Thermochemical Propulsion* (taught by Prof. Piscaglia) I performed a CFD analysis over a 3D combustor model with the shape of a cylinder in which the fuel was injected. A bluff body, placed inside the combustor, enhances the turbulence that helps the mixing between the hot air and the sprayed fuel. The combustion of the multiphase flow was also considered.

SCHOLARSHIPS AND CERTIFICATES

- FEBR. 2016 | **AWARD "GIACOMO VOLONTE 2016"**
I ranked first of over 200 students for my thesis: "CALCOLO STIMA ASSORBIMENTO, Pinza freno per auto da competizione".
- AUGUST 2016 | **ENGLISH COURSE AND TEST**
I spent 4 weeks in the Centre of English Studies in Leeds, UK, achieving the final level C1.
- MAY 2019 | **BECOME A PROJECT MANAGER WITH LEONARDO**
I was among the 25 selected students to attend a 3 month course on Project Manager at Leonardo Helicopters

SCIENTIFIC PUBLICATIONS AND PRESENTATION

- JULY 2019 | **8TH EUROPEAN CONFERENCE FOR AERONAUTICS AND AEROSPACE SCIENCES**
My MSc's work has been presented during the 8th EUCASS in July 2019

LANGUAGES

ITALIAN: Mother tongue ENGLISH: Fluent - C1 RUSSIAN: Basic - A2

COMPUTER SKILLS

- Adv. Knowledge: | MATLAB, OPENFOAM, LINUX, Latex, MS OFFICE, CATIAV5, MATHCAD, GMSH, WINDOWS, FREECAD, C++
- Good Knowledge: | VBA, AUTOCAD, SOLIDWORKS, INVENTOR, CAR MAKING, PYTHON