

CURRICULUM VITAE OF ENG. MOSE' ROSSI, PHD

PERSONAL INFORMATION Mosè Rossi



Working address: Piazza Università 5, 39100 Bolzano-Italy-Office K1.06

Phone: +39 0471 017701

Email address: mose.rossi@unibz.it

Linkedin: <https://www.linkedin.com/in/mos%C3%A8-rossi-40a65869/>

Sex Male | **Nationality** Italian

EDUCATION

- 11/2015 – 07/2019** **PhD in "Sustainable Energy and Technology"**
Topic: Fluid Machinery/Energy Systems (ING/IND 08-09)
Free University of Bozen/Bolzano, Bolzano – Italy
- 02/2016 – 06/2019** **Specialist's Degree in Numerical Simulation in Engineering with ANSYS**
(Turbomachinery and Multiphase majoring)
Technical University of Madrid, Madrid - UPM - Spain
Passed modules:
 - Fundamental and Application of Computational Fluid Dynamics (CFD)
 - Turbomachinery
 - Multiphase
- 06/2015 – 09/2015** **Engineering professional practice examination - 185/200**
Marche Polytechnic University, Ancona - Italy
- 10/2012 – 12/2014** **Master's degree in Mechanical Engineering - 110/110 CUM LAUDE**
Marche Polytechnic University, Ancona - Italy
- 10/2009 – 10/2012** **Bachelor's degree in Mechanical Engineering - 108/110**
Marche Polytechnic University, Ancona - Italy
- 09/2004 – 07/2009** **High School Leaving Qualification - 100/100**

ACADEMIC EXPERIENCE

11/2018 – Present

Postdoctoral Researcher

Topic: Fluid Machinery/Energy Systems (ING/IND 08-09)

Free University of Bozen/Bolzano, Bolzano - Italy

- Efficiency improvement of Pelton turbines when operating at part-load conditions: In particular, numerical study of both nozzle and spear valve geometries through Computational Fluid Dynamics (CFD) simulations with ANSYS® Fluent® and laboratory tests with Laser Doppler Anemometry (LDA). This work is in collaboration with TROYER S.p.A.
- Application of axial turbines close to rivers weirs and study of their behaviour depending on the operating conditions, thus improving the efficiency of the hydraulic machine. This work is performed through Computational Fluid Dynamics (CFD) simulations with ANSYS® CFX® and laboratory tests. This work is in collaboration with AC-TEC S.r.l.
- CFD simulations with ANSYS® CFX® of a new prototype small-scale Francis turbine to study its fluid dynamic behaviour. This hydraulic machine will be installed in a Water Distribution Network (WDN) of a municipality located in Germany and will replace a Pressure Reducing Valve (PRV). This work is in collaboration with AC-TEC S.r.l.
- Design, production, experimental and CFD simulations of a small-scale Archimedes screw using ANSYS® Fluent®
- Design and implementation of both low and high pressure water circuits in order to perform laboratory tests on hydraulic machines mentioned in the previous bullet points
- Analytical/statistical studies and CFD simulations of Pumps-as-Turbines (PaTs) to be installed in determined installation sites (e.g. WDNs and oil refineries) in order to understand the fluid dynamic behaviour

10/2015 – 07/2019

PhD Student in "Sustainable Energy and Technology"

Topic: Fluid Machinery and Energy Systems (ING/IND 08-09)

Free University of Bozen/Bolzano, Bolzano - Italy

- Analytical/statistical studies, laboratory tests and CFD simulations of Pumps-as-Turbines (PaTs) to be installed in determined installation sites (e.g. WDNs and oil refineries) in order to understand the fluid dynamic behaviour
- Design of a cooling system of a Diesel engine used for power generation purposes. The engine is fed by syngas coming from biomass and the heat of exhausted gases is recovered, constituting a Combined Heat and Power (CHP) small-scale plant
- Study of the interaction between two immiscible liquids (Rayleigh-Taylor instability)
- Study of the behaviour of Selective Catalytic Reducers (SCRs) in order to decrease NO_x concentrations in Diesel engines used in the automotive sector

02/2018 – 05/2018

Visiting PhD Student

Brno University of Technology (BUT), Brno - Czech Republic

Energy Institute, Victor Kaplan Department of Fluid Engineering - Faculty of Mechanical Engineering

- Experimental and numerical studies of centrifugal PaTs, where the last ones were performed with ANSYS® CFX®
- Velocity triangles analysis: comparison between theoretical calculations, considering an infinite blade count, and numerical results of a tested and simulated centrifugal PaT

03/2012 – 09/2012

Internship at DIISM (Marche Polytechnic University)

DIISM (Department of Industrial Engineering and Mathematical Sciences), Ancona (Italy)

Thesis development for Bachelor's Degree in Mechanical Engineering

Thesis title: Technical analysis of economic convenience of Combined Heat & Power (CHP) technologies in Europe countries according to the cost of electricity and natural gas

Main activities:

- Data collection of both net and gross prices related to the costs of electricity (€/kWh) and natural gas (€/Nm³) in European countries for householders and industries.
- Analysis of the most used technologies in CHP small-scale plants such as Internal Combustion Engines (ICE), micro-gas turbines, fuel cells.
- Definition of a new parameter, based on the ratio between the cost of the fuel and the electricity, that allows users to assess the profitability of CHP plants and choose the best technology according to the regulations of the EU nation where they are installed.

WORK EXPERIENCE

07/2014 – 11/2014

Internship at api refinery of Ancona S.p.A.

Thesis development for Master's Degree in Mechanical Engineering.

Thesis title: Feasibility study of a gas flaring recovery system installed in an oil refinery.

Main activities:

- Monitoring the flare gas flow rate as well as its chemical composition
- Study of possible technologies, such as liquid ring compressor and ejector, and layouts related to the flare gas recovery system
- Both energetic and economic analysis of this kind of intervention

TEACHING ACTIVITIES

Teaching assistant

- Exercises of "Fluid Machines" course held in English at Free University of Bozen/Bolzano in the A.A. 2018/2019
- Exercises of "Fluid Machines" course held in English at Free University of Bozen/Bolzano in the A.A. 2019/2020

Thesis Co-Supervisor

- Bachelor's thesis of Marco Poda entitled "Evaluation of Pumps-as-Turbine (PaTs) for energy recovery in water distribution plants"
- Bachelor's thesis of Alex Braiato entitled "Numerical study of a two-stage Francis turbine for energy recovery applications"
- Bachelor's thesis of Davide Stivala entitled "Pelton water jet quality: CFD study on the effect of the nozzle geometry"
- Bachelor's thesis of Giovanni Davi entitled "Study of the design and of the performance of a choclea in weirs application"
- Bachelor's thesis of Claudio Bertamini entitled "Effect of fluid viscosity on the performance of PaTs in chemical plants"

ACADEMIC ACTIVITIES

Research projects

- 2018–current: EFRE-FESR "TURB_HYDRO: hydrokinetic turbines, optimization for sustainable production", ERDF 2018-2021, Project reference (CUP): I56C18000040009. I have participated to the project as a Postdoctoral Researcher in the research group of Dr. Massimiliano Renzi at Free University of Bozen/Bolzano. The aim of the project is to develop hydraulic turbines, such as Pelton, Francis and Kaplan, suitable for small-scale hydropower applications. In particular, the project focuses the attention on the increase of their performance when dealing with part-load operating condition, where a consistent efficiency drop is recorded. Free University of Bozen/Bolzano, Troyer S.p.A. and AC-Tec S.r.l. are involved equally in the research project
- 2015–2018: Provincial project "AI-ALPEN: Approvvigionamento Idropotabile in regioni ALPine: riduzione delle perdite ed ottimizzazione ENergetica per una sostenibilità a lungo termine", Project reference (CUP): B26J16000300003. I have participated to the project as a PhD student in the research group of Dr. Massimiliano Renzi at Free University of Bozen/Bolzano. The aim of the project was to study and optimize the performance of hydraulic machines, such as PaTs, to be installed in WDNs. Free University of Bozen/Bolzano and University of Trento were involved equally in the research project

Speaker at conferences

- 71st Conference of the Italian Thermal Machines Engineering Association, ATI 2016, September 14th - 16th, 2016, Turin, Italy
- 2nd International Conference on Advances on Clean Energy Research, ICACER 2017, April 7th - 9th, 2017, Berlin, Germany
- 10th International Conference on Applied Energy, ICAE 2018, August 22nd - 25th, 2018, Hong Kong, China
- 73rd Conference of the Italian Thermal Machines Engineering Association, ATI 2018, September 12th - 14th, 2018, Pisa, Italy
- 30th Symposium on hydraulic machinery and systems, IAHR 2020, July 5th - 10th, 2020, Lausanne, Switzerland (planned)

External consultancy

- Röchling Automotive S.r.l., Via Alfred Nobel, 11, 39055 Laives (BZ) - Italy (Topic: Analysis of SCRs in order to decrease NO_x concentrations)
- AC-Tec S.r.l. (hydropower sector), Zona Artigianale, 26, 39052 Caldaro (BZ) - Italy (Topic: Efficiency improvement of a Kaplan turbine for large-scale application and a double stage Francis turbine for small-scale one)
- Faber S.p.A. (range hoods), Viale XIII Luglio, 160, 60044 Fabriano (AN) - Italy (Topic: Efficiency improvement of range hoods)

TRAINING ACTIVITIES

Courses

- IEEE ITALY SECTION SCHOOL ON FUTURE ENERGY SYSTEMS, February 1st - 5th, 2016, University of Trento (UNITN)
- COMPUTATIONAL FLUID DYNAMICS, July 25th - 29th, 2016 & August 1st - 5th, 2016, Free University of Bozen/Bolzano (unibz)
- INTRODUCTION TO PROGRAMMING WITH MATLAB, October - December, 2016, Vanderbilt University, Nashville, Tennessee - USA (Online course on Coursera)
- ADVANCED RESEARCH IN TURBOMACHINERY (ART), July 10th - 14th, 2017, University of Florence (UNIFI)
- PRESSURE CONTROL WITH ENERGY PRODUCTION BY PAT (PUMP AS TURBINE) IN WATER SUPPLY NETWORKS, September 11th - 15th, 2017, CISM - Udine
- ENGINEERING SIMULATIONS WITH OPEN SOURCE CODES (ESOS), October 2nd - 4th, 2019, Free University of Bozen/Bolzano (unibz)

PERSONAL SKILLS

Language skills

Italian

mother tongue

English

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
B2	B2	C1	C1	C1

*Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user
Common European Framework of Reference for Languages*

Computer skills (order of knowledge)

- Microsoft Office
- ANSYS[®] CFX[®]
- ANSYS[®] Fluent[®]
- AutoCAD[®] 2D
- MATLAB[®]
- LabVIEW[®]
- SolidWorks[®]
- AMESim[®]