CHIARA ANFOSSO

PhD Student

PROFILE

As a PhD student, I am part of Thermochemical Power Group (TPG) of the University of Genoa since November 2021. My activities here started during the Master's Degree Thesis, where I focused on innovative energy system based on heat pump and NIR solar façade panels. I have now gained experience on integrated system based on micro-gas turbines, heat pumps, solar panels and thermal energy storages: in this field, I learnt to work autonomously developing and implementing the system control logic and overseeing the experimental campaign at the Innovative Energy Laboratory of the University of Genoa of ENVISION European Project, which gave birth to two publications presented at the ICAE international conferences. I have also gained experience on system modelling in MATLAB/Simulink environment developing both an integrated system model based on the aforementioned components as well as a mGT model able to operate with different innovative fuels (i.e. hydrogen and ammonia). Concerning the experimental activities, I used to work with acquisition system based on National Instrument technologies (i.e. LabVIEW) through which it has been possible to experimental validate the realized integrated system model. During the last year, I also improved my knowledge on innovative power to ammonia to power system in the framework of FLEXNCONFU European project, which gave birth to a publication that will be presented at the ASME international conferences that will be yield on next June. Thanks to the experience I acquired and to additional courses during the PhD studies, I can individuate and solve technical issues that may arise from the experimental activity and to realize models which can help in defining the most critical aspect that may occurs in the realization of innovative energy system. During this experience, I also had the opportunity to improve my skills in other languages and I approved the national exam to access the Order of the Engineers.

EDUCATION

September 2019 – October 2021	**Università degli Studi di Genova –** Master's Degree in Energy Engineering. Main fields: renewable energy, electric power systems, power plants, fuel cell technologies, biofuels. Master Thesis Title's: "Dynamic model for the integration of heat pump and NIR façade panels system". Final score: 110L/110.
September 2015 – July 2019	**Università degli Studi di Genova** Bachelor's Degree in Industrial and Management Engineering – cv Industrial Engineering. Final score: 105/110.
2010 – 2015	IIS "G. Ruffini" (Imperia). Economic High School Diploma. Final score: 93/100.

WORK EXPERIENCE AND PROJECTS

November 2021 – Current	**PhD student at Università degli Studi di Genova** Main fields: stationary and transient analysis of integrated system at the Innovative Energy System Laboratory in Savona, data acquisition and analysis from experimental tests, system control logic implementation, study of the correlation between the main parameters of the system. Development of MATLAB/Simulink models of mGTs. HPs, TEs, and solar panels.
September 2022 – Current	**FLEXnCONFU European Project** taking part in the realization of P2A2P system at the Savona Laboratory. Realization of a mGT model operating with alternatives fuel to better evaluate the critical aspect related to the use of ammonia or hydrogen in GT application. Dimensioning of the alternative's fuels injection line together with the placement of all the sensors necessary to allow to operate the turbine with pre cracked ammonia safely.
November 2021– September 2022	**ENVISION European Project** taking active part in the European Project ENVISION, developing a control system of the innovative plant based on coupling NIR solar façade panels with HP, mGT and two TESs minimizing the CO_2 emission and carrying out experimental test in the Savona Laboratory. In the framework of this project, I cooperate with several partner (i.e. TNO, EDF, Azko Nobel) participating at two General Assembly, at one Review Meeting and being a presenter of one related paper at the ICAE Conference 2022: the paper has been selected for the special issues by Applied Energy.

May 2021 – October 2021	**Master's Degree Thesis "Dynamic model for the integration of heat pump and NIR façade panels system"**. The thesis is focused on the dynamic model design of the HP which is connected to NIR solar façade panels. The HP model has been validated on the experimental data obtained during the experimental campaign carried out the Tirreno Power Laboratory in the framework of the 'PUMP-HEAT' European project.
March 2019 – July 2019	**Bachelor's Degree Thesis "Flood wave propagation model on the Tiber rod "** (data analysis of several critical flood events in Rome occurring since 2001 through Matlab software, algorithm definition to predict the next event based on weather condition).
2023 – Current	**Teaching experience** Teaching support at the mechanical engineer course of "sperimentazione di sistemi energetici innovative ed a fonti rinnovabili" at University of Genoa.

PUBLICATIONS

2022

- Anfosso, C., Gini, L., Bellotti, D., Pascenti, M. and Magistri, L., 2022. Experimental results of an innovative NIR-solar façade panels-based polygeneration system. Energy, 2004, p.2965.
- Anfosso, C., Gini, L., Bellotti, D. and Magistri, L., 2022. Dynamic model validation of an innovative NIR-solar facade panels-based integrated system. Energy, 2004, p.2965.
- Anfosso, C., Gini, L., Mantelli, L., Ferrando, M., Reboli, T. and Traverso, A., 2022, December. Butane-based heat pump for advanced GTCC applications: static and dynamic model validation. In Journal of Physics: Conference Series (Vol. 2385, No. 1, p. 012092). IOP Publishing.

Current

To be published:

- Bellotti, D., Anfosso, C., Magistri, L., Massardo, A.F., 2023, June. Partially cracked ammonia for micro-Gas Turbine application. ASME Turbo EXPO 2023.

SKILLS

Interpersonal

Self-motivated, capable of working under pressure. Very good organization and communication skills when team working. Enthusiastic about improving skills. Strong sense of multiculturalism and professionalism. Passionate about sustainability in everyday life.

Languages and certificates

Italian	English	French
Mother tongue	B2	B2
-	University Certification	ESABAC Certification

Informatics

Proficient user	**Microsoft Windows**, **Microsoft Office, Matlab-Simulink, LabVIEW**
Independent user	**AutoCAD**, **EnergyPlus**, **SketchUp, Ansys-Fluent**

Personal interests

Love learning new languages and travelling. Tennis player since I was a kid with good national and international results.

Driving licence

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