

# Alessandra Cuneo, Ph.D

## Curriculum Vitae

*I am active in the field of energy systems, especially in modelling, design optimization and simulation. I focus my attention on the propagation of uncertainties to the energy systems performances. In addition, I investigate the flexibility enhancement of power plants. My actual expertise covers the following topics:*

- *H2020 Project Coordination*
- *Uncertainty quantification and probabilistic design*
- *Gas turbine combined cycle and flexibility enhancement*
- *Management of smart poly-generation grids and renewable sources integration*
- *Fuel cell application, gas turbine fuel cell hybrid systems*
- *MATLAB-Simulink, steady-state model for performance analysis*
- *Thermodynamics, energy systems, heat transfer, statistics*

### PROFESSIONAL EXPERIENCE

*Jan 2019 – Now*

#### **PROJECT MANAGER at Research and Innovation Division**

*RINA Consulting, Genoa, Italy*

- Project Coordinator of two H2020 Projects (SunHorizon, MUSE GRIDS)
- H2020 proposal preparation

*Jan 2017 – Dec 2018*

#### **ASSOCIATE RESEARCHER**

*University of Genoa, Genoa, Italy*

- Uncertainty quantification analysis
- Combined cycle flexibility enhancement
- Energy systems analysis and modelling

*Feb 2014 – Dec 2018*

#### **COLLABORATION**

*Rolls-Royce Fuel Cell System University Technology Centre*

- Fuel cell gas turbine hybrid systems
- Performance model of advanced power system (Matlab/Simulink)
- Off-design performance analysis

*May 2016 - Oct 2016*

#### **VISITING RESEARCHER**

*Rolls-Royce plc, Derby, UK*

- Uncertainty quantification analysis
- Robust design methodologies
- Linux and Python expertise

*Feb 2014*

#### **TRAINEESHIP**

*VITO, Mol, Belgium*

- Contribute to build a simulation environment for district energy simulations
- Multi-agent simulation
- Work in close contact with industrial customers

*Oct 2012 – Jan 2013*

#### **VISITING RESEARCHER** under Erasmus Placement Program

*VTT (Technical Research Centre of Finland), Helsinki, Finland*

- Thermodynamic and economic evaluation
- Smart grid simulation

## SCIENTIFIC ACTIVITIES

- Attended ASME Turbo Expo 2018, Lillestrøm (Oslo)
- Responsible for University of Genoa for H2020 EU Project “PUMP-HEAT” ([www.pumpheat.eu](http://www.pumpheat.eu))
- Attended European Fuel Cell Conference 2017, Naples (Italy)
- Attended ASME Turbo Expo 2017, Charlotte (North Carolina)
- Responsible for smart grid simulation within “RESILIENT” European project (FP7)
- Responsible for the development of multi-agent simulation environment within “E-HUB” European project (FP7)
- Attended Sustainable Places Conference 2015, Savona (Italy)
- Attended ECOS Conference 2014, Helsinki (Finland)
- Attended Sustainable Places Conference 2014, Nice (France)
- Reviewer for ASME Turbo Expo, Elsevier Journal (Energy, Applied Energy)

## ACADEMIC STUDIES

*Jan 2014 - Dec 2016*

### PH.D IN MECHANICAL ENGINEERING

*University of Genoa*

**Thesis title:** Uncertainty quantification and stochastic analysis of advanced energy systems

- Probabilistic methods to study the propagating dominant uncertainty
- Modelling and simulation of advanced energy systems (i.e. fuel cell gas turbine hybrid systems)
- Several scientific publications

*July 2015*

Italian professional qualification as Engineer - Civil and Environmental Sector (Section A)

*Sep 2010 - Mar 2013*

### MSC DEGREE IN ENVIRONMENTAL ENGINEERING: SUSTAINABLE DEVELOPMENT & RISK MANAGEMENT

*University of Genoa*

**Final mark** 110/110 (cum laude)

**Thesis title:** Energy-hub for residential and commercial districts: Comparison of different renewable energy systems within the E-hub European Project

- Modelling of smart-grid
- Optimization strategy for smart grid
- Active within an European project

*Sep 2007 – Sep 2010*

### BSC DEGREE IN ENVIRONMENTAL ENGINEERING

*University of Genoa*

**Final mark** 110/110 (cum laude)

**Thesis title:** Design of a swimming pool solar system: energy and economic analysis

- Modelling of energy systems
- Analysing the results from an engineering point of view

## JOURNAL PUBLICATIONS

1. A. Cuneo, A. Giugno, L. Mantelli, A. Traverso, 2019, Uncertainty quantification analysis of a pressurized fuel cell hybrid system, ASME Paper GT2019-91351, ASME Turbo Expo 2019, Phoenix, AZ (USA).
2. A. Cuneo, A. Traverso, A.F. Massardo, 2019, “Compressor Instability Analysis Within a Hybrid System Subject to Cycle Uncertainties”, Journal of Engineering for Gas Turbines and Power, Vol.141, pp. 011006\_1-9.
3. A. Giugno, A. Cuneo, A. Traverso, 2019, “Analysis of uncertainties in compact plate-fin recuperators for microturbines”, Applied Thermal Engineering, Vol.150, pp.1243–1251.

4. V. Zaccaria, A. Cuneo, A. Sorce, 2018, "Influence of Multiple Degrading Components on Gas Turbine Fuel Cell Hybrid System Lifetime", GPPS Forum 2018, pp.1-9, Zurich, Switzerland.
5. A. Cuneo, V. Zaccaria, D. Tucker, A. Sorce, 2018, "Gas turbine size optimization in a hybrid system considering SOFC degradation", Applied Energy, Vol.230, pp.855–864.
6. A. Abrassi, A. Cuneo, D. Tucker, A. Traverso, 2017, "Fuel Cell Microturbine Hybrid System Analysis Through Different Uncertainty Quantification Methods", ASME Paper GT2017-63178, ASME Turbo Expo 2017, Charlotte, NC (USA).
7. A. Cuneo, A. Traverso, S. Shahpar, 2017, "Comparative Analysis of Methodologies for Uncertainty Propagation and Quantification", ASME Paper GT2017-63238, ASME Turbo Expo 2017, Charlotte, NC (USA).
8. A. Cuneo, V. Zaccaria, D. Tucker, A. Traverso, 2017, "Probabilistic analysis of a fuel cell degradation model for solid oxide fuel cell and gas turbine hybrid systems", Energy, Vol.141, pp.2277-2287.
9. M.L. Ferrari, A. Cuneo, M. Pascenti, A. Traverso, 2017, "Real-time state of charge estimation in thermal storage vessels applied to a smart polygeneration grid", Applied Energy, Vol.206, pp.90-100.
10. Rossi, L. Banta, A. Cuneo, M.L. Ferrari, A.N. Traverso, A. Traverso 2016, "Real-time management solutions for a smart polygeneration microgrid", Energy Conversion and Management, Vol. 112, pp. 11-20.
11. M. Rivarolo, A. Cuneo, A. Traverso, A.F. Massardo, 2016, "Design optimisation of smart poly-generation energy districts through a model based approach", Applied Thermal Engineering, Vol.99, pp.291-301.

## **LANGUAGES**

Italian: Mother tongue

English: Fluent in reading, writing and speaking. FCE Certificate (in 2013)

## **INFORMATIC SKILLS AND COMPETENCES**

Operating systems: Windows and Linux

Software: Matlab/Simulink, Microsoft Office, Amesim

Programming language: Python and Fortran

Tool for design and simulation of energy systems: Trnsys, IDA ICE Climate, iSight

## **PERSONAL SKILLS**

I am able to work in project teams learned during my last experiences. In particular, the internship at VTT, VITO and RR, and the collaboration in different European projects helped me to improve this skill. My collaboration within different European projects also helped me to organize my work to respect deadlines and writing scientific reports. In addition, thanks to several lecture in University and presenting papers during different conferences, I am able to present a work in front of technical experts.

## **EXTRA-PROFESSIONAL INTEREST**

Sports: I have been practiced archery at professional level from 1999 until now, playing various national match with good results. This helps me to be concentrated and focused on a goal under stressful condition.

Hobbies: Reading, Music, Theatre and Museum

Association: From 2000 to 2006, I joined Boy Scout. Thanks to my educator and animator rules, I learnt how to organize meeting and activity for a group of people, as a task leader.

Alessandra Cuneo