

Federico Giudici

Dept. of Electronics, Information, and Bioengineering
Politecnico di Milano
Piazza Leonardo da Vinci, 32
20133 Milano, Italy

Phone +39 (02) 2399 9632
federico.giudici@polimi.it
<https://www.deib.polimi.it/eng/people/details/823478>
<http://www.nrm.deib.polimi.it>

KEY INFORMATION



Federico Giudici was born in Vigevano (PV - Italy) in 1991. He received a BSc degree and a MSc degree cum laude in Environmental and Land Planning Engineering at Politecnico di Milano in 2013 and 2016 respectively. In 2015 he was visiting student at ETH-Zurich, where he developed his master thesis in collaboration with the Department of Hydrology and Water Resources Management under the supervision of Professor Andrea Castelletti. Since Fall 2016, he is a PhD candidate in Information Technology in the Natural Resources Management group of Professor Andrea Castelletti at the Department of Information, Electronics and Bioengineering at Politecnico di Milano, working on a project financed by the company RSE SpA. His research interests mainly include the analysis and the modelling of hybrid renewable energy systems, the design and the management of complex water-energy systems under uncertainty, and the use and development of optimization and machine learning algorithms.

EDUCATION

April 2016

MSc (with honors) in Environmental and Land Planning Engineering

Politecnico di Milano
Milan, I

September 2015 – December 2015

MSc thesis research training
Supervisor: Prof. Paolo Burlando

Swiss Federal Institute of Technology (ETH)
Zurich, CH

September 2013

BSc in Environmental and Land Planning Engineering

Politecnico di Milano
Milan, I

PROFESSIONAL EXPERIENCE

Current position

November 2016 –

PhD candidate - Information Technology
Dept. of Electronics, Information, and Bioengineering
Optimal design and operation of hybrid energy systems
in remote, off-grid communities
Supervisors: Prof. Andrea Castelletti, Elisabetta Garofalo

Politecnico di Milano, RSE SpA
Milan, I

Past positions

July 2016 – October 2016

Research Fellow
Dept. of Civil and Environmental Engineering
Assessing the value of hydrological predictions for
hydropower sector

Politecnico di Milano
Milan, I

RESEARCH PROJECTS

2015 – 2019: *IMPRES Project. IMProving PRedictions and management of hydrological EXtremes*. Project funded by the H2020 programme of the European Union, GA no. 641811. *Role*: Researcher at Politecnico di Milano.

2018: *SMART-DSYS 2018, Sviluppo e gestione delle reti di distribuzione*. Project funded by Ricerca di sistema (RSE SpA). *Role*: PhD student at RSE SpA.

2018: *SMART CITIES 2018, Smart cities and smart communities*. Project funded by Ricerca di sistema (RSE SpA). *Role*: PhD student at RSE SpA.

TEACHING ACTIVITY

Student supervision – MSc students

2018 – 2019: Fabio Gardella, Impacts of technological innovation on the sustainability of remote, off-grid systems (co-supervisor)

2018 – 2019: Andrea Cantore, Assessing the effects of climate-related variables on electricity prices in a changing energy market (co-supervisor)

2017 – 2018: Giorgio Falcini and Elena Muratore, The effects of climate and socio-economic changes on the design of off-grid hybrid energy systems (co-supervisor)

2016 – 2017: Rachele Tarantola, The value of weather/streamflow forecasts for hydropower companies (co-supervisor)

LANGUAGES

ITALIAN: native

ENGLISH: C1 level – 2012, Test of English for International Communication (TOEIC)

COMPUTER SKILLS

Operating Systems: Microsoft Windows, Apple Mac OS X, GNU/Linux

Programming Languages: Matlab, Python, C++, R, Octave, Fortran

Database management systems: MySQL

Microsoft Software: MS Office Suite, Open Office Suite

Geographic Information System: ArcGIS, QuantumGIS, SagaGis

Others: HomerEnergy, Latex, Adobe Illustrator, Microsoft Visual Studio

AWARDS

National

2015: *Thesis abroad scholarship*

PUBLICATIONS

Journal papers

[A.1] **Giudici, F.**, Giuliani, M., Castelletti, A., Maier, H. R. (2019). An active learning approach for identifying the smallest subset of informative scenarios in robust planning optimization. *Environmental Modelling & Software*, *Under Review*.

[A.2] **Giudici, F.**, Castelletti, A., Garofalo, E., Giuliani, M., Maier, H. R. (2019). Dynamic, multi-objective optimal design and operation of water-energy systems for small, off-grid islands. *Applied Energy*, 250, 615-616.

[A.3] Bertani, D., **Giudici, F.** (2019). Sistemi di accumulo e decarbonizzazione delle isole minori. *AEIT*, 104 (1/2), 6-12.

Conference proceedings

[B.1] Morandi, S., Mancusi, L., Volonterio, M., **Giudici, F.**, Garofalo, E. (2019). A multi-objective optimization approach to identify robust intervention strategies to improve the sustainability and the efficiency of urban water systems. In: *Proceedings of World Environmental and Water Resources Congress 2019*, Pittsburgh, US, 19-23 May 2019.

Abstracts/Extended abstracts

- [C.1] **Giudici, F.**, Giuliani, M., Castelletti, A., Maier, H. R. (2019). Selection of the smallest subset of informative scenarios for the robust optimization of off-grid hybrid energy systems. In: *DMDU Annual Meeting 2019*, Delft, Netherlands, 5-7 November 2019.
- [C.2] **Giudici, F.**, Castelletti, A., Garofalo, E., Maier, H. R. (2019). Robust design of off-grid hybrid energy systems under climatic and technological uncertainty. In: *DMDU Annual Meeting 2019*, Delft, Netherlands, 5-7 November 2019.
- [C.3] **Giudici, F.**, Giuliani, M., Castelletti, A. (2019). Multi-objective optimal control of integrated water-energy systems in small off-grid islands. In: *1st IFAC Workshop on Control Methods for Water Resource Systems*, Delft, Netherlands, 19-20 September 2019 (oral).
- [C.4] Falcini, G., Muratore, E., **Giudici F.**, Castelletti, A., Airoidi, D., Garofalo, E., Giuliani, M., Maier, H. R. (2019). Robust design of off-grid water-energy systems under climate and socio-economic changes. In: *EGU General Assembly 2019*, Vienna, Austria, 7-12 April 2019 (poster).
- [C.5] **Giudici F.**, Castelletti, A., Airoidi, D., Garofalo, E., Giuliani, M., Maier, H. R. (2019). Contrasting non-dynamic and dynamic models of the water-energy nexus in small off-grid Mediterranean islands. In: *EGU General Assembly 2018*, Vienna, Austria, 8-13 April 2018 (oral).
- [C.6] Zamberletti, P., **Giudici F.**, Giuliani, M., Anghileri, D., Castelletti, A., Burlando, P. (2018). High spatial resolution assessment of climate change impact on an Alpine watershed. In: *EGU General Assembly 2018*, Vienna, Austria, 8-13 April 2018 (poster).
- [C.7] **Giudici, F.**, Anghileri, D., Castelletti, A., Burlando, P. (2017). On the effects of adaptive reservoir operating rules in hydrological physically-based models. In: *EGU General Assembly 2017*, Vienna, Austria, 23-28 April 2017 (oral).
- [C.8] Anghileri, D., **Giudici, F.**, Castelletti, A., Burlando, P. (2017). Advancing reservoir operation description in physically based hydrological models. In: *EGU General Assembly 2016*, Vienna, Austria, 17-22 April 2016 (poster).

Technical reports

- [D.1] **Giudici, F.**, Volonterio, M., Garofalo, E. (2018). Identificazione di soluzioni tecnologiche e gestionali per migliorare la sostenibilità del sistema idrico-energetico delle isole minori. Rapporto RSE RDS 18007797, www.rse-web.it.
- [D.2] Mancusi, L., Morandi, S., **Giudici, F.** (2018). Pianificazione strategica di sistemi a rete efficienti per le smart cities: validazione di un caso di studio di applicazione del modello WaterMet2 e valutazione di scenari di interventi. Rapporto RSE RDS 18007813, www.rse-web.it.
- [D.3] **Giudici, F.**, Airoidi, D., Garofalo, E. (2018). Ottimizzazione del sistema idrico-energetico integrato nelle isole minori. Rapporto RSE RDS 17006668, www.rse-web.it.
- [D.4] Mancusi, L., Morandi, S., Volonterio, M., **Giudici, F.** (2018). Efficienza energetica del servizio idrico integrato. Rapporto RSE RDS 18002181, www.rse-web.it.
- [D.5] Airoidi, D., Bertani, D., Garofalo, E., Guastella, S., Lembo, E., Sandroni, C., **Giudici, F.** (2017). Scenari di sviluppo delle FER nelle isole minori italiane non interconnesse e analisi di casi di studio. Rapporto RSE RDS 17004171, www.rse-web.it.

Theses

- [E.1] **Giudici, F.**, Advancing reservoir operation description in physically based hydrological models, MSc Thesis (Supervisor: Prof. Andrea Castelletti), Politecnico di Milano, 2016.
- [E.2] **Giudici, F.**, Il ruolo dei serbatoi idroelettrici nella gestione della risorsa idrica del Lario, BSc Thesis (Supervisor: Prof. Giorgio Guariso), Politecnico di Milano, 2013.