

Sofia FELLINI

PERSONAL INFORMATIONS

BIRTH DATE AND PLACE: 4th March 1991, Bussolengo (Verona), Italy
NATIONALITY: Italian

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AFFILIATION: *Department of Environmental, Land, and Infrastructure Engineering,*
Politecnico di Torino, Corso Duca degli Abruzzi 24, 10129 Turin, Italy.
Laboratoire de Mécanique des Fluides et d'Acoustique,
Ecole Centrale de Lyon, 36, avenue Guy de Collongue, 69134 Ecully, France.

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CURRENT POSITION

PHD CANDIDATE: Phd program in Civil and Environmental Engineering.
International joint program between **Politecnico di Torino** and **École Centrale de Lyon**.

ADVISORS: Luca Ridolfi (Politecnico di Torino), Pietro Salizzoni (École Centrale de Lyon).

The main subject of my PhD is the application of innovative techniques to understand and model pollutant dispersion in the urban atmosphere. Currently, I'm applying tools from complex network theory to model gas dispersion from a source as a spreading process on a complex network. In this way, the polluted area and the number of people affected by the release are assessed, and vulnerability maps of a city are rapidly constructed. I'm also performing wind tunnel experiments to study the role of heat fluxes and vegetation on the vertical mass exchange in a street canyon. The aim is to model the velocity of pollutant removal from a street.

KEYWORDS: Urban Air Pollution | Street Canyon Ventilation | Complex Network Theory | Environmental Fluid Mechanics

RESEARCH INTERESTS

Urban air pollution: phenomenological models for propagation of substances in the urban atmosphere.

Water distribution systems: hydraulic models; optimization methods; network management; hydroelectric production in water systems.

EDUCATION, RESEARCH ACTIVITY AND TEACHING EXPERIENCE

- MARCH 2019
present Teaching Assistant for the course *Technical hydraulics*, **Politecnico di Torino** (Italy).
- NOVEMBER 2017
present PhD Candidate, Joint program between **Politecnico di Torino** (Italy) and **École Centrale de Lyon** (France). Subject: Pollutant dispersion in the urban canopy: wind tunnel experiments and innovative modeling. Supervisors: Prof. Pietro Salizzoni and Prof. Luca Ridolfi.
- DECEMBER 2015
OCTOBER 2017 Research Assistant, **Politecnico di Torino** and **SMAT**, Turin (Italy). Subject: Analysis, study and modeling of the hydraulic behavior of a new water supply system in the Susa Valley (Turin). Supervisors: Prof. Luca Ridolfi and Prof. Fulvio Boano.
- OCTOBER 2013
OCTOBER 2015 Master Degree in Environmental and Land Engineering, **Politecnico di Torino**, Turin (Italy). Final Grade: 110/110 cum laude. Thesis: “Equilibrium cross- section of rivers with riparian vegetation” . Advisor: Prof. Luca Ridolfi and Prof. Carlo Camporeale.
- OCTOBER 2010
SEPTEMBER 2013 Bachelor Degree in Environmental and Land Engineering, **Università degli Studi di Padova**, Padova (Italy). Final Grade: 110/110. Thesis: “Hydro-climatic fluctuations and water resources management in the Nacimiento River watershed.” Advisor: Prof. Gianluca Botter.
- SEPTEMBER 2005
JULY 2010 High school diploma with specialization in foreign languages, **Liceo Classico e Linguistico Scipione Maffei**, Verona. Final Grade: 100/100.

CONFERENCES AND SCHOOLS

- 4-8 MAY 2020, *EGU General Assembly 2020*, Vienna, Austria (**online presentation**).
- 17-19 DECEMBER 2020, **Winter School: Data and model integration in fluid mechanics**, Imperial College London, UK (*attendee*).
- 1-14 JULY 2019, **Summer School: Fluid Dynamics of Sustainability and the Environment**, Ecole Polytechnique de Paris, France (**poster presentation**).
- 20-25 JANUARY 2019, *Environmental Fluid Dynamics: Confronting Grand Challenges*, Les Houches, France (**oral presentation**).
- 1-6 JULY 2018, *HIC 2018. 13th International Conference on Hydroinformatics*, Palermo, Italy (**oral presentation**).
- 20-22 JUNE 2018, *Phd Days of the Hydraulic Italian Group (GII)*, Catania, Italy (**oral presentation**).
- 29 NOV.-1 DEC. 2017, *Complex networks & Their Applications*, Lyon, France (*attendee*).
- 19 OCTOBER 2016, *Water networks: modelling, management and innovation*, Bologna, Italy (*attendee*).
- 5-6 MAY 2016, *First Symposium: Water as a global resource*, Turin, Italy (*attendee*).

CERTIFICATES, SCHOLARSHIPS AND AWARDS

- JULY 2018 The HIC 2018 best student paper award for Hydraulic and hydrological modelling, HIC 2018, Palermo (Italy).
- 2017-2020 IDEXLYON financial support for a doctoral international mobility of ten in Lyon, Université de Lyon, Lyon (France).
- JULY 2017 PhD scholarship for a 3-year joint PhD program, Politecnico di Torino & École Centrale de Lyon.
- FEBRUARY 2017 Qualification for the Practice of Professional Engineering, Turin (Italy).
- DECEMBER 2015 Fellowship for a 2-year Research Activity, Politecnico di Torino & SMAT, Turin (Italy).

PUBLICATIONS

Fellini, Sofia; Salizzoni, Pietro; Ridolfi, Luca, (2020) *Centrality metric for the vulnerability of urban networks to toxic releases*, PHYSICAL REVIEW E, APS, DOI: 10.1103/PhysRevE.101.032312.

Fellini, Sofia; Salizzoni, Pietro; Ridolfi, Luca, (2020) *Street canyon ventilation: Combined effect of cross-section geometry and wall heating*, QUARTERLY JOURNAL OF THE ROYAL METEOROLOGICAL SOCIETY, Wiley, DOI: 10.1002/qj.3795.

Fellini, Sofia; Vesipa, Riccardo; Boano, Fulvio; Ridolfi, Luca, (2020) *Fault detection in level and flow rate sensors for safe and performing remote-control in a water supply system*, JOURNAL OF HYDROINFORMATICS, IWA, DOI: 10.2166/hydro.2019.002.

Vesipa, Riccardo; **Fellini, Sofia**, (2019) *Instability of the tank-level control system of water mains in mountainous environments*, JOURNAL OF HYDRAULIC ENGINEERING, ASCE, DOI:10.1061/(ASCE)HY.1943-7900.0001609.

Fellini, Sofia; Salizzoni, Pietro; Soulhac, Lionel; Ridolfi, Luca, (2019) *Propagation of toxic substances in the urban atmosphere: A complex network perspective*, ATMOSPHERIC ENVIRONMENT, Elsevier, ISSN: 1352-2310, DOI: 10.1016/j.atmosenv.2018.10.062.

Fellini, Sofia; Vesipa, Riccardo; Boano, Fulvio; Ridolfi, Luca, (2018) *Real-Time Measurement Fault Detection and Remote-Control in a Mountain Water Supply System*, EPIC SERIES IN ENGINEERING, In: EPiC Series in Engineering, EasyChair, HIC 2018. 13th International Conference on Hydroinformatics, Palermo (ITALY), DOI: 10.29007/7k9l.

Fellini, Sofia; Vesipa, Riccardo; Boano, Fulvio; Ridolfi, Luca, (2017) *Multipurpose Design of the Flow-Control System of a Steep Water Main*, JOURNAL OF WATER RESOURCES PLANNING AND MANAGEMENT, ASCE, DOI: 10.1061/(ASCE)WR.1943-5452.0000867.

LANGUAGES

- ITALIAN: Mother tongue
- ENGLISH: Full professional proficiency (Level B2) | **FCE (2010)**
- FRENCH: Full professional proficiency (Level B2) | **DELFB2 (2010)**
- GERMAN: Professional working proficiency (Level B1) | **Goethe-Zertifikat B1 (2009)**

Turin, 10th June 2020

