Luca Ferrari

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KEY INFORMATION

I am a PhD student in Environmental Science and Forest Resources Management at ETH Zürich. I received an MSc in Environmental Engineering from Politecnico di Milano, specializing in environmental systems modeling and decision-making under deep uncertainty. My research interests lie in applying mathematical modeling and deep learning techniques for forecasting climate change and drought-related tree mortality in Swiss forests. Previously, I worked on applying deep learning for simulation and forecasting of air quality and on robustness analysis of optimal climate policies developed by the Integrated Assessment Model RICE50+ for climate decision support in a multi-objective and deeply uncertain context.

EDUCATION

Doctor of Science
ETH Zürich
Zürich, Switzerland
01/2024 – ongoing

MSc in Environmental and Land Planning Engineering
Politecnico di Milano
Milano, Italy
03/2019 – 12/2021

BSc in Environmental and Land Planning Engineering
Politecnico di Milano
Milano, Italy
09/2015 – 03/2019

High School Graduation
Liceo Scientifico Galileo Galilei
Trento, Italy
09/2010 – 07/2015

PROFESSIONAL EXPERIENCE

Current position

PhD Student
ETH Zürich
Dept. of Environmental Systems Science
Zürich, Switzerland
Forest Resources Management Group
01/2024 – ongoing

Past positions

Scientific assistant
ETH Zürich
Dept. of Environmental Systems Science
Zürich, Switzerland
Forest Resources Management Group
04/2023 – 12/2024

Research assistant
Politecnico di Milano
Dept. of Electronics, Information and Bioengineering
Milano, Italy
Systems and Control
01/2022 – 05/2023

Collaborator — **SustainNow**
SustainNow blog & podcast — Zollikon, Switzerland
https://www.sustainnow.ch/sustainnow/categories/blog — **05/2022 – 08/2022**

On call employee — **Coop MAAP**
Trento, Italy
08/2015

Intern — **Azienda Agricola Fratelli Pisoni**
Sarche, Italy
08/2014

Intern — **Edmund Mach Foundation**
San Michele all'Adige - Italy
06/2013

TEACHING ACTIVITY
Teaching assistant
2024 -: *Seminar Environmental Systems*, BSc in Environmental Science, ETH Zürich, Switzerland.

RESEARCH ACTIVITIES
Research projects
2024 – 2028 UPSCALE: Nowcasting, forecasting, upscaling - Novel avenues for forest vitality monitoring and anticipating forest dynamics. Role: PhD student.
2023 Innocheque: New Insurance Solutions for planted forests. Role: scientific assistant
2022 – 2023 AgriAir: Data science to reduce agri-food impact on air quality in the Po Valley. Role: research assistant.
2021-2022 Multi-Objective Climate Policy Design. Role: master student/research assistant.

SERVICES
Scientific societies
Member of the IFAC Technical Committee on Modelling and Control of Environmental Systems (T.C. 8.3), from 11/2023.

Conference scientific committees and session organization
2023
Member of the organizing committee of the 13th "Risikoworkshop". ETH Zürich, Zürich, Switzerland, October 2023.

Affiliations
ETH AI Center, associated PhD Student, from 02/2024.
Member of the International Tree Mortality Network, from 01/2024.
Member of the International Federation of Automatic Control (IFAC), from 11/2023.
Member of the Society for Decision Making Under Deep Uncertainty (DMDU), from 09/2022.

Volunteering
Member of Telejob: entrepreneurial-driven non-profit organization connecting ETH students and staff with their dream jobs in industry, academia, or entrepreneurship, from 02/2024.
Member of PoliMappers: volunteer mapping using free and open-source software, from 09/2021.

PUBLICATIONS

Journals

1.1. **Ferrari, L.**, & Guariso G. (2024). Convolutional Forecasting of Particulate Matter: Toward a Data-Driven Generalized Model. *Atmosphere*, 15, 398. doi: https://doi.org/10.3390/atmos15040398.

1.2. **Ferrari, L.**, & Guariso G. (2023). Geography-based Neural Networks for the Simulation of Air Pollution. *IFAC-PapersOnLine*, 56(2), 8296–8301. doi: https://doi.org/10.1016/j.ifacol.2023.10.1017.

1.3. **Ferrari, L.**, Carlino, A., Gazzotti, P., Tavoni, M., & Castelletti, A. (2022). From optimal to robust climate strategies: expanding integrated assessment model ensembles to manage economic, social, and environmental objectives. *Environmental Research Letters*, *17*(8), 084029**.** doi: http://dx.doi.org/10.1088/1748-9326/ac843b.

Conferences & talks

2.1. **Ferrari, L.**, & Guariso G. (2023). Geography-based Neural Networks for the Simulation of Air Pollution. In *22nd World Congress of the International Federation of Automatic Control (IFAC 2023 World Congress).* Online, 9-14 July 2023.

Posters

3.1. **Ferrari, L.**, Mathys, A, & Griess, V. (2023). A process-based assessment of tree stress and risk under drought conditions. SwissForestLab Science Day 2023: Forests in the Anthropocene: Impacts of heat and drought on forest functioning. Zurich, Switzerland, October 2023.

Theses

4.1. **Ferrari, L.**, Drivers of uncertainty, high-risk scenarios, and robust climate policies in RICE50+, MSc Thesis (Supervisor: prof. Andrea Castelletti), Politecnico di Milano, 2021. Full text: https://www.politesi.polimi.it/bitstream/10589/181660/1/2021_12_Ferrari.pdf.

4.2. **Ferrari, L.**, Analisi della serie storica di incendi nella provincia di Trento in un periodo climaticamente consistente (1984-2016), BSc Thesis (Supervisor: prof. Renato Casagrandi), Politecnico di Milano, 2019.

REFERENCES

Prof. Verena Griess
Full Professor of Forest Resources Management
Dept. of Environmental Systems Science, ETH Zürich
verena.griess@usys.ethz.ch
+41 44 632 32 10
Supervisor on the Innocheque and UPSCALE projects

Dr. Mirela Beloiu Schwenke
Postdoctoral researcher, Chair of Forest Resources Management
Dept. of Environmental Systems Science, ETH Zürich
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+41 44 632 88 65
Supervisor on the UPSCALE project

Prof. Giorgio Guariso
Full Professor of Advanced Environmental Systems Analysis, and Modelling and Simulation (retired)
Dept. of Electronics, Information and Bioengineering, Politecnico di Milano

giorgio.guariso@polimi.it
+39 02 2399 3559
Supervisor on the AgriAir project