MARCO MIOTTI

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RESEARCH EXPERIENCE

Senior Researcher (Oberassistent), Lecturer February 2023 – present
Chair of Ecological Systems Design, ETH Zurich

- Scientific coordinator and work package lead, SEAMLESS, energy impacts of future mobility (SFOE; 2026–)
- Project lead, LUMOS land-use/transport interaction model (ETH Foundation / Federal Railways; 2024–)
- Work package lead, BlueCity flagship project on urban digital twins (Innosuisse, 2023–)
- Lead developer, aperta and aperta-atlas, open-source accessibility pipeline (2024–)

Postdoctoral Fellow November 2019 – October 2022
Urban Informatics Lab, Stanford University

Research Assistant September 2014 – October 2019
Trancik Lab, MIT

Research Assistant November 2013 – February 2014
Laboratory for Energy Systems Analysis, Paul Scherrer Institute

EDUCATION

Massachusetts Institute of Technology (MIT) 2014 – 2019
Ph.D. in Engineering Systems
Committee: Jessika Trancik (chair, advisor), John Heywood, P. Christopher Zegras

Swiss Federal Institute of Technology (ETH) Zurich 2010 – 2013
MSc in Environmental Engineering, with distinction

Swiss Federal Institute of Technology (ETH) Zurich 2007 – 2010
BSc in Environmental Sciences

PROFESSIONAL EXPERIENCE

Centro Nacional de Producción Más Limpia February 2014 – June 2014
Swiss Civilian Service | Bogotá, Colombia

Global Risk Forum Davos August 2013 – October 2013
Swiss Civilian Service | Davos, Switzerland

Evonik Industries March 2012 – September 2012
Intern | Marl, Germany & Shanghai, China

PEER-REVIEWED JOURNAL ARTICLES

Miotti, Räth, Elvarsson, and Hellweg. Calibrated transport networks and accessibility indicators for Switzerland. *In final author review.*

Räth, **Miotti**, Grêt-Regamey, Hellweg, and Van Strien. When local change adds up: Predicting population and employment across spatial scales. *In final author review.*

Miotti and Hellweg. Efficient and representative door-to-door travel time estimation for planning and policy. *Transportation.* [Link].

Miotti and Trancik. Determinants of electric vehicle emissions savings and costs across locations and individuals. *Environmental Research Letters.* [Link].

Meyer de Freitas, **Miotti**, Zani, and Axhausen. Rethinking cost–benefit analysis for transformative cycling policies: integrating behavioral change and the logsum method. *Transport Policy*, 2026. [Link].

Ho, **Miotti**, and Jain. Building energy consumption and urban form: A multi-temporal empirical investigation. *Environment and Planning B: Urban Analytics and City Science*, 2025. [Link].

Miotti, Needell, and Jain. The impact of urban form on daily mobility demand and energy use: evidence from the United States. *Applied Energy*, 2023. [Link].

Miotti and Jain. Modeling aggregate human mobility patterns in cities based on the spatial distribution of local infrastructure. *2021 Hawaii International Conference on System Sciences.* [Link].

Miotti, Needell, Ramakrishnan, Heywood, and Trancik. Quantifying the impact of driving style changes on light-duty vehicle fuel consumption. *Transportation Research Part D: Transport and Environment*, 2021. [Link].

McNerney, Needell, Chang, **Miotti**, and Trancik. TripEnergy: Estimating personal vehicle energy consumption given limited travel survey data. *Transportation Research Record: Journal of the Transportation Research Board*, 2017. [Link].

Fletcher, **Miotti**, Swaminathan, Klemun, Strzepek, and Siddiqi. Water Supply Infrastructure Planning: Decision-Making Framework to Classify Multiple Uncertainties and Evaluate Flexible Design. *Journal of Water Resources Planning and Management*, 2017. [Link].

Miotti*, Supran*, Kim, and Trancik. Personal vehicles evaluated against climate change mitigation targets. *Environmental Science & Technology*, 2016. [Link]. *authors contributed equally.

Miotti, Hofer, and Bauer. Integrated environmental and economic assessment of current and future fuel cell vehicles. *International Journal of Life Cycle Assessment*, 2015. [Link].

PREPRINTS

Miotti. Fast and scalable traffic volume estimation using modified betweenness centrality. SSRN (Preprint), 2025. [Link].

CONFERENCE PAPERS

Miotti. How fast are bicycles and e-bikes compared to other modes? An accessibility-based analysis. *Transportation Research Procedia. In press.*

Ho, **Miotti**, and Jain. Exploring the Empirical Relationship Between Urban Form and Building Energy Use. *2023 ASCE International Conference on Computing in Civil Engineering.* [Link].

Miotti and Jain. A computationally efficient algorithm to enable privacy preserving urban energy data sharing under the "15/15" rule. *Energy Proceedings 2022.* [Link].

Miotti and Jain. Modeling aggregate human mobility patterns in cities based on the spatial distribution of local infrastructure. *2021 Hawaii International Conference on System Sciences.* [Link].

Miotti, Needell, and Trancik. Quantifying Reductions in Personal Vehicle Energy Consumption Due to Driving Style Changes. *Transportation Research Board 97th Annual Meeting*, 2018. [Link].

BOOK CHAPTERS, REPORTS AND LETTERS

Meyer de Freitas, **Miotti**, and Zani. Effects of an E-Bike City. In *The E-Bike City: Designing sustainable streets.* Axhausen and Elliot (eds). ETH Zurich, 2025. [Link].

Schenker, **Miotti**, and Pfister. Sustainability assessment of battery supply chains and externalities in e-bike mobility. In *The E-Bike City: Designing sustainable streets.* Axhausen and Elliot (eds). ETH Zurich, 2025. [Link].

Trancik, Edwards, Kavlak, Klemun, McNerney, **Miotti**, Needell, Pereira, Supran, and Wei. "Notes on scale: Why U.S. states can make a significant contribution to the Paris Agreement." Press release, 2017. [Link].

Trancik, Supran, and **Miotti**. "Reality is that most EVs emit less CO2 than petrol cars over their lifetimes." Letter, The Financial Times, Nov. 20 2017. [Link].
Most read letter of the week in The Financial Times online.

Trancik, Brown, Jean, Kavlak, Klemun, Edwards, McNervey, **Miotti**, Mueller, and Needell. Technology improvement and emissions reductions as mutually reinforcing efforts: Observations from the global development of solar and wind energy. Technical report, 2015. [Link].

Treyer, Oshikawa, Bauer, and **Miotti**. Work Package 4: Environment. In *Energy from the Earth: Deep Geothermal as a Resource for the Future?* Hirschberg, Wiemer, and Burgherr (eds). VDF Hochschulverlag, Zurich, 2015. [Link].

DATASETS

Miotti, Räth, Elvarsson, and Hellweg. High-resolution multi-modal accessibility metrics for Switzerland. Prerelease [Link].

Miotti, Räth, Elvarsson, and Hellweg. Dataset Open Calibrated multi-modal transport networks for Switzerland [Link].

Miotti, Needell, and Jain. Measures of urban form and mobility energy use indices for each census tract in the United States. Data Dryad. [Link].

SOFTWARE AND TOOLS

aperta. Calibrated, cross-modal accessibility analysis in Python. github.com/mmiotti/aperta. Responsibilities: conceptualization, software engineering. Prerelease; 64 Github ⋆ since May 2026.

Carboncounter.com and Carboncounter.lu. Responsibilities: concept, design, programming, data collection, maintenance, server setup. Reached 500,000+ unique visitors.

FM Sensing (Android app; discontinued). Responsibilities: helped to integrate TripEnergy (a model to estimate vehicle trip fuel consumption) into server-side framework; developed a server-side module in Python to measure the eco-driving performance of a car drivers.

CONFERENCE PRESENTATIONS (SELECTION)

Miotti, Elvarsson, and Hellweg. Beyond Zones: Multi-Scale, Raster-Network Hybrid Modeling for the Active Mobility Era, Modeling Active Mobility Seminar, Cambridge UK, 2026.

Miotti. How fast are bikes and e-bikes compared to other modes? An accessibility-based analysis. World Conference on Transport Research, 2026.

Miotti, Elvarsson, and Hellweg. Quantifying accessibility and its implications for sustainable urban mobility systems. International Land Use Symposium, Dresden, DE, 2025.

Miotti and Hellweg. A detailed atlas on urban form in Switzerland to understand travel demand across scales. 23rd Swiss Transport Research Conference, Ascona, CH, 2023.

Miotti, Jain. A computationally efficient algorithm to enable privacy preserving urban energy data sharing under the "15/15" rule. Intern. Conference on Applied Energy, Bochum, DE, 2022.

Miotti, Jain. Path to zero-carbon mobility: The role of urban planning and the built environment. Gordon Research Seminar (GRS) on Industrial Ecology, Newry ME, USA, 2022.

Miotti, Trancik. Leveraging data to estimate localized emissions and costs of personal vehicles. Gordon Research Seminar (GRS) on Industrial Ecology, Les Diablerets, Switzerland, 2018.

GRANTS AND FELLOWSHIPS (AS LEAD AUTHOR OR CO-LEAD AUTHOR)

2026 Swiss Federal Office of Energy (SFOE). “SEAMLESS: Swiss Energy Assessment from Long-Term Mobility Scenarios”. CHF 420k.

2024 ETH Zurich Center for Sustainable Future Mobility. “A high-resolution, multi-scale urban land use transport interaction model for sustainable spatial and mobility planning in Switzerland”; CHF 250k.

2021 Stanford Center for Integrated Facility Engineering. “A big data modeling framework for evaluating the impact of urban design and constructability on multi-scale city energy usage”. USD 50k.

2019 Stanford TomKat Center for Sustainable Energy. "A coupled urban mobility and building energy model to inform emission reduction strategies of cities" (Postdoc Fellowship). USD 160k.

2019 Swiss National Science Foundation (SNF). "Developing a coupled urban mobility and building energy model to inform energy consumption reduction strategies of cities" (Postdoc Fellowship). CHF 100k.

2019 MyEnergy. “Adaptation of 'carboncounter.com' for the context of Luxembourg”. USD 35k.

2018 Toyota Motor Company. “An integrated, parametrized emissions model for light-duty vehicles”. USD >100k (amount confidential).

2018 MIT Martin Family. “Evaluating technology evolution pathways against climate goals: the case of light-duty vehicles” (Sustainability Graduate Fellowship). USD 80k.

TEACHING AND MENTORSHIP EXPERIENCE

Classroom teaching

Environmental Engineering Seminar, ETHZ (co-lecturer, all lectures)	Fall 2025 – present
Prospective Environmental Assessments, ETHZ (co-lecturer, 2+ lectures)	Spring 2024 – present
Introduction to Life Cycle Assessment, MIT (guest lecturer, 2 lectures)	Fall 2017

Teaching education

Kaufman Teaching Certificate Program (KTCP), MIT	Summer 2018

Supervision

Postdoctoral research (co-supervision)

Yves Räth	2025 – present

PhD research (co-supervision)

Carlo Schmid	2024 – present
Eleanor Ho	2021 – 2023
Full supervision of 3 graduate students during lab director's parental leave	Summer 2020

Master's projects and theses

Anna Bellosi	Fall 2025
Samantha Yi-Shuen Liu	Fall 2020 and 2021

Bachelor's projects and theses

Leonie Droege	Spring 2025
Anna Bogatu, Anne Graf	Spring 2024
Nathanael Monhart	Spring 2024
Triana Hernandez Hasselkus	Summers 2021 and 2022
Sai Sameer Pusapaty	Fall 2017
Christiane Adcock	Spring 2017

Teaching assistancy

Mapping and Evaluating New Energy Technologies, MIT	Fall 2017

AWARDS & HONORS

Best Paper Award nominee, 2021 Hawaii International Conference on System Sciences 2021
Best Paper Award, Transportation Research Board Energy Subcommittee (4th author) 2018
Editor's Choice Paper, Journal of Water Resources Planning and Management (2nd author) 2018
Siebel Scholarship 2017
Willi-Studer Prize (for best GPA in master's program), ETH Zurich 2013
Unitech Fellowship, ETH Zurich 2012

MEDIA COVERAGE (SELECTION)

The New York Times. "Just How Good for the Planet Is That Big Electric Pickup Truck?" 2023-02-17
USA Today. "Fact check: Lifetime carbon emissions lower for electric vehicles than gas-powered cars." 2022-06-09
The New York Times. "Electric Cars Are Better for the Planet – and Often Your Budget, Too." 2021-01-15
The Guardian. "New MIT app: check if your car meets climate targets." 2016-09-28
The New York Times. "An App to Help Save Emissions (and Maybe Money) When Buying a Car." 2016-09-27
NPR. "It May Not Cost You More To Drive Home In A Climate-Friendly Car." 2016-09-27

SERVICE

Deputy, Departmental Commission, ETH Zurich, Department of Civil, Environmental, and Geomatic Engineering 2025 – present
Representative, Teaching Commission, ETH Zurich, Department of Civil, Environmental, and Geomatic Engineering 2024 – present
President, MIT IDSS Student Council 2018 – 2019
Captain, MIT IDSS Ice Hockey Team 2017 – 2019
Co-Organizer, MIT Policy Hackathon: From Data to Decisions 2018
Military (completed regular service / training school), Swiss Air Force 2006

Manuscript reviewer (selection)
Science; Nature Energy; Environmental Research Letters; Transportation Research Part D: Transport & Environment; Transportation; Transportation Research Record; Journal of Transport Geography; Applied Energy; Environmental Science & Technology; and others.

SKILLS

Spoken languages
German (native), English (proficient / C2), Spanish (experienced / B2), Swedish (elementary / A2), French (elementary / A2).

Programming and markup languages
20,000+ lines written: Python, Javascript, HTML/CSS | 2,000+ lines written: R, SQL, LaTeX.

Software
QGIS/ArcGIS, Adobe Photoshop/Illustrator/InDesign, version control (Git).

INTERESTS

Sports (hiking/backpacking, running, ice hockey, cycling), photography, cooking.