

Trivik Verma

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Education

- Jan 2016 PhD, Complex Network Analysis
ETH Zurich, Switzerland
Structure and Dynamics of the World Airline Network [[Link](#)]
- Aug 2012 MSc, Computer Engineering: Networks and Distributed Systems
Delft University of Technology, The Netherlands
Vulnerability of Power Grids to Cascading Failures [[Link](#)]
- Jun 2010 BSc, Computer Science and Engineering
Manipal University, India

Professional Experience

- Sep 2023– Member of Board of Studies, EPA MSc Program
Faculty of Technology, Policy and Management, Delft University of
Technology
- Jan 2020–Dec 2022 Director, AI Lab
Faculty of Technology, Policy and Management, Delft University of
Technology
- Apr 2019– Co-Director of Centre for Urban Science and Policy (CUSP)
Delft University of Technology, cusp.tbm.tudelft.nl
- Apr 2019– [Tenured] Assistant Professor of Urban Science and Policy
Faculty of Technology, Policy and Management, Delft University of
Technology
- Dec 2017–Mar 2019 Senior Postdoctoral Fellow
Dept. of Environmental Systems Science, ETH Zurich
- Apr 2015–Nov 2017 Chief Data Scientist, Head of Publishing and Co-Founder
Board Member (Present)
The Outdoor Journal and Voyage, Luxembourg
- Apr 2011–Dec 2012 Research Scientist
Performance of Networks and Systems
Netherlands Organisation for Applied Scientific Research (TNO)
- Jan 2010–May 2010 Network Security Engineer
Cisco Systems, India

Teaching

Certified University Teaching Qualification (UTQ) by [Universities of The Netherlands](#)

2019–	Module Manager and Lecturer, Spatial Data Science, 200 MSc students, TU Delft, [open-source course material]
2019–2022	Lecturer, Advanced Simulation, 120 MSc students, TU Delft
2019–	Supervisor, Bachelor Project, 10 students, TU Delft
2019–	Supervision, Master Thesis, over 35 students, TU Delft
2018	Teaching Assistant, Spatial Analysis, Modelling and Optimisation, Environmental Science at ETH Zurich
2018–	Instructor in Climate Change & Photography, National Geographic and Smithsonian

Grants

An overview of funded grants and other major grants where I made a significant contribution, received positive reviews, but did not receive funding in the final round.

2024–2027	<u>Candidate Dropped Out</u> , MOSAIC PhD Proposal, 300K EURO, PI
2024–2025	<u>Under Review, round II</u> , Driving Urban Transitions, 1.5M EURO, WP Leader (350k)
2024–2028	<u>Rejected</u> , ERC Starting Grant, 1.5M EURO (Review: Exceptional Profile)
2023–2024	<u>Rejected in Shortlist</u> , ICLEI Action Fund, 1M EURO, Co-PI
2023	Open Education Fund on Decolonising Data Science, TU Delft, 20K EURO, PI
2023–2027	HORIZON Europe grant for project titled “DUST: Democratising Just Urban Transitions”, 3.8M EURO, Task Leader (120k)
2022	Resilient Delta Initiative grant for project titled “Citizen Voice”, 30K EURO, Co-PI
2021–2025	Internal TU Delft Fund - 1 PhD on “Reproduction of Spatial Inequalities”, 200K EURO, PI
2021–2022	Internal TU Delft Fund - 1 Postdoc on “Urban Inequalities and Spatial Justice”, 180K EURO, PI
2022	TU Delft DDFV Open Subsidy for a summer school on “Just Transitions”, 7.5K EURO, Co-PI
2021	TU Delft Safety and Security Fund for project titled “SpeakUp! Conversational Agents for Mental Health and Well-being”, 5K EURO, Co-PI
2021	<u>Rejected in Shortlist</u> Dutch Research Council grant for project “1million Homes”, 9.8M EURO, WP Leader (400k)
2020–2021	Municipality of the Hague for “Developing Methods to estimate Mobility in Cities using Open-source Data”, 100K EURO, PI

Publications

► Draft in Preparation

- Verma, T., & Robinson, C. (2023). Rethinking Urban Governance. (Submitting to *Nature Cities*)
- Nawaz, M., Goncalves, J., Hoppe, T., Doorn, N., & Verma, T. (2023). Developing Renovation Policies to Tackle Energy Poverty. (Submitting to *Energy Policy*)
- Goncalves, J., Kraaijvanger, C., Arab, R., & Verma, T. (2023). A Socio-spatial analysis of Climate Vulnerability. (Submitting to *Nature Sustainability*)
- Goncalves, J., & Verma, T. (2023). Transforming Cities – A Research Agenda for Global Urban Challenges. (Submitting to *Nature Cities*)
- Kaufmann, T., Agostini, G., & Verma, T. (2023) Mobility of Travel and Proximity Equity Gap in American Cities. (Submitting to *Env Planning B*)
- Nicoletti, L., Santi, P., Warnier, M., & Verma, T. (2022). Tweets Matter: Quantifying the Spatio-Temporal Relationship Between Social Media Activism and Physical Protest. (Archived) [[Link](#)]

► Under Review or In Press

- Nelson, R., Warnier, M., & Verma, T. (2023). Housing Inequalities: The space-time geography of housing policies. (Submitted to *Cities*).
- Liezenga, A.M., Verma, T., Mayaud, J., Aydin, N., & van Wee, B. (2023). The first mile towards access equity: is on-demand microtransit a valuable addition to the transportation mix in suburban communities? (Submitted to *Journal of Transport Geography*)
- Kraaijvanger, C., Verma, T., Doorn, N., & Goncalves, J. (2023). Evaluating Access to Solar Energy in Light of a Just Energy Transition. Available at SSRN 4375481. (Forthcoming *Energy Research & Social Science*) [[Link](#)]
- Jovic, I., van Boven, E., Manolopoulos, I., Verma, T., & van Mieghem, P. (2023). Modelling the Multi-layer Dynamics of Co-Evolution of Urban Regions: A case of Dutch Municipalities. (with Centraal Bureau voor de Statistiek). (Submitted to *PNAS*)
- Nelson, R., Warnier, M., & Verma, T. (2023). Conceptualising Urban Inequality as a Complex Socio-technical Phenomenon. (Forthcoming *Geographical Analysis*). [[Link](#)]
- Sundaram, A., Goncalves, J., Ghorbani, A., & Verma, T. (2023). Designing Policies for Equitable Adoption of Rooftop Solar PV. Available at SSRN 4403544. (Forthcoming *Energy Research & Social Science*). [[Link](#)]
- Herzog, R., Goncalves, J., Slingerland, G., Kleinhans, R., Holger, P., Brazier, F., & Verma, T. (2023). Identifying Public Values and Spatial Conflicts in Urban Planning. (Forthcoming *Urban Studies*). [[Link](#)]

► Peer-Reviewed Journal Articles

- Kolkowski, L., Cats, O., Dixit, M., Verma, T., Jenelius, E., Cebecauer, M., & Rubensson, I. J. (2023). Measuring activity-based social segregation using public transport smart card data. *Journal of Transport Geography*, 110, 103642. [[Link](#)]
- Reggiani, G., Verma, T., Daamen, W., & Hoogendoorn, S. (2023). A multi-city study on structural characteristics of bicycle networks. *Environment and Planning B: Urban Analytics and City Science*, 23998083231170637. [[Link](#)]
- Nicoletti, L., Sirenko, M., & Verma, T. (2023). Disadvantaged Communities have Lower Access to Urban Infrastructure. *Environment and Planning B: Urban Analytics and City Science*, 23998083221131044. [[Link](#)]

- Patel, R., Verma, T., Marvuglia, A., Huang, Y., Baustert, P., Shivakumar, A., & Nikolic, I. (2022). Quantifying Households' Carbon Footprint in Cities using Socioeconomic Attributes: A case study for The Hague (Netherlands). *Sustainable Cities and Society*, 104087. [\[Link\]](#)
- Wang, Z., Pel, A. J., Verma, T., Krishnakumari, P., van Brakel, P., & van Oort, N. (2022). Effectiveness of Trip Planner Data in Predicting Short-term Bus Ridership. *Transportation Research Part C: Emerging Technologies*, 142, 103790. [\[Link\]](#)
- Badhrudeen, M., Derrible, S., Verma, T., Kermanshah, A., & Furno, A. (2022). A Geometric Classification of World Urban Road Networks. *Urban Science*, 6(1), 11. [\[Link\]](#)
- Verma, T., Sirenko, M., Kornecki, I., Cunningham, S., & Araújo, N. A. (2021). Extracting Spatiotemporal Demand for Public Transit from Mobility Data. *Journal of Urban Mobility*, 1, 100004. [\[Link\]](#)
- Yap, J. R., Jafino, B. A., & Verma, T. (2021). Equity Principles Highlight Variations in Road Network Criticality. *Findings*, 24900. [\[Link\]](#)
- Garbasevschi, O. M., Schmiedt, J. E., Verma, T., Lefter, I., Altes, W. K. K., Droin, A., Schirike, B., & Wurm, M. (2021). Spatial Factors Influencing Building Age Prediction and Implications for Urban Residential Energy Modelling. *Computers, Environment and Urban Systems*, 88, 101637. [\[Link\]](#)
- Melo, H. P., Henriques, J., Carvalho, R., Verma, T., da Cruz, J. P., & Araújo, N. A. M. (2021). Heterogeneous Impact of a Lockdown on Inter-municipality Mobility. *Physical Review Research*, 3(1), 013032. [\[Link\]](#)
- Verma, T., Rebelo, L., & Araújo, N. A. (2019). Impact of Perceived Distances on International Tourism. *PloS one*, 14(12), e0225315. [\[Link\]](#)
- Verma, T., Araújo, N. A. M., Nagler, J., Andrade Jr, J. S., & Herrmann, H. J. (2016). Model for the Growth of the World Airline Network. *International Journal of Modern Physics C*, 27(12), 1650141. [\[Link\]](#)
- Verma, T., Russmann, F., Araújo, N. A., Nagler, J., & Herrmann, H. J. (2016). Emergence of Core-peripheries in Networks. *Nature communications*, 7(1), 1-7. [\[Link\]](#)
- Louzada, V. H., Araujo, N. A., Verma, T., Daolio, F., Herrmann, H. J., & Tomassini, M. (2015). Critical Cooperation Range to Improve Spatial Network Robustness. *PloS one*, 10(3), e0118635. [\[Link\]](#)
- Rosas-Casals, M., Bologna, S., Bompard, E. F., D'Agostino, G., Ellens, W., Pagani, G. A., Scala, A., & Verma, T. (2015). Knowing Power Grids and Understanding Complexity Science. *International Journal of Critical Infrastructures*, 11(1), 4-14. [\[Link\]](#)
- Verma, T., Ellens, W., & Kooij, R. E. (2015). Context-independent Centrality Measures Underestimate the Vulnerability of Power Grids. *International Journal of Critical Infrastructures* 7, 11(1), 62-81. [\[Link\]](#)
- Verma, T., Araújo, N. A., & Herrmann, H. J. (2014). Revealing the Structure of the World Airline Network. *Scientific reports*, 4(1), 1-6. [\[Link\]](#)

► Peer-Reviewed Conference Articles

- Buijtenweg, A., Verma, T., Cats, O., Donners, B., & Wang, H. (2021, June). Quantifying the Hierarchy of Public Transport Networks. In *2021 7th International Conference on Models and Technologies for Intelligent Transportation Systems (MT-ITS)* (pp. 1-6). IEEE. [\[Link\]](#)
- Wang, Z., Luo, D., Cats, O., & Verma, T. (2020, September). Unraveling the Hierarchy of Public Transport Networks. In *2020 IEEE 23rd International Conference on Intelligent Transportation Systems (ITSC)* (pp. 1-6). IEEE. [\[Link\]](#)

- Verma, T., Folini, M., Wang, Y., Heinimann, H. R., & Araújo, N. A. (2019). Decentralized Optimal Route Navigation. In *Complex Networks 2018, The 7th International Conference on Complex Networks & Their Applications, December 11-13, 2018, Cambridge, United Kingdom. Book of Abstracts* (pp. 501-504). International Conference on Complex Networks & Their Applications. [[Link](#)]
- Orbe, C., Verma, T., Balac, M., & Ciari, F. (2015). Evaluating the Effects of Variable User Demand on a Round-trip, One-way, and Free-floating Car Sharing Fleet in the City of Zurich, Switzerland. *hEART 2015: List of Abstracts*. [[Link](#)]
- Koç, Y., Verma, T., Araújo, N. A., & Warnier, M. (2013, November). Matcasc: A Tool to Analyse Cascading Line Outages in Power Grids. In *2013 IEEE International Workshop on Intelligent Energy Systems (IWIES)* (pp. 143-148). IEEE. [[Link](#)]

► **Book Chapters**

- Fard, A. E., & Verma, T. (2022). A Comprehensive Review on Countering Rumours in the Age of Online Social Media Platforms. *Causes and Symptoms of Socio-Cultural Polarization*, 253-284. [[Link](#)]

Academic Supervision

► **Postdoc Researchers**

- Dr Juliana Goncalves, Postdoc in Social Impact Assessment and Spatial Justice, TU Delft, Jan 2021 – Aug 2022.
Currently Tenure Track Assistant Professor in the TU Delft Climate Action Program.
- Mikhail Sirenko, Researcher in Urban Transit and Accessibility, TU Delft, Oct 2019 – Oct 2020.
Currently Postdoc at TU Delft and Researcher at World Bank.

► **PhD Candidates**

- [**Advisor**] Ruth Nelson, Addressing Urban Inequalities through Integrated Urban Policy, TU Delft, Aug 2021 – Present.
- [**Co-Advisor**] Joshua Yang, Digitally Assisted Participatory Decision Making, ETH Zurich, Oct 2022 – Present.
Advisor: Prof. Dirk Helbing
- [**Visiting Candidate**] Clara Peiret-Garcia, Understanding Inequalities in Access to Amenities using Geolocated Survey Data, Newcastle University, Sep 2023 – Feb 2024.
Advisor: Prof. Rachel Franklin
- [**Visiting Candidate**] Anastassia Vybornova, Designing Segregation Models Highlighting Mechanisms of Inequalities, ITU, Denmark, Sep 2023 – Feb 2024.
Advisor: Dr. Michael Szell
- [**External Advisor and Exam Committee**] Dr Talia Kaufmann, Computational City Planning, School of Public Policy, Northeastern University, USA, Aug 2020 – Aug 2022.
Advisor: Prof. David Lazer
- [**Advisor**] Dr Amir Ebrahimi Fard, Countering Rumours in Online Social Media, TU Delft, Apr 2019 – March 2021.

- **Supervised over 35 Master and 10 Bachelor Students. An overview of a select few student thesis from the last two years is mentioned below.**

- Chiem Kraaijvanger, [Sharing our Sunlight: Evaluating Access to Solar Energy in Light of a Just Energy Transition](#)
- Ettore Arpini, [Urban Commons as a Driver of Social Inclusion](#)
- Mobeen Nawaz, [The Renovation Wave: An opportunity to tackle energy poverty?](#)
- Alma Liezenga, [Escaping Suburbia: A Case Study on Microtransit and Access Equity in the Minneapolis-St.Paul Metropolitan Area](#)
- Laszlo Vreedenburgh, [Lights in the Night: Outage Identification using Remote Sensing in India](#)
- Ionannis Ioannou, [Urban Voices: Citizen Voice: An innovative Open-source Map-based tool for effective public participation](#)
- Lukas Kolkowski, [Measuring activity-based Social Segregation using Public Transport Smart Card Data](#)
- Lotte Lourens, [Resilient and Equitable Accessibility: Taking into account societal vulnerability in decision making on the placement of flood adaptation policies in an urban setting](#)
- Rico Herzog, [Cities for Citizens: Identification of Socio-Spatial Conflicts of Public Values in Urban Regions](#)
- Esmée Tijhuis, [Predictability of Human Mobility Behavior After a Major Disaster](#)
- Leonardo Nicoletti, [Hashtags as a Means for Political Action](#)
- Aarthi Meenakshi Sundaram, [Evaluating the Role of Urban Social Networks in Adoption of New Technology for Sustainable City Development](#)

Many of these thesis were supervised with colleagues at TPM and TU Delft such as Nazli Aydin, Igor Nikolic, Sander van Cranenburgh, Alexander Verbraeck, Martijn Warnier, Neelke Doorn, Bert van Wee, Cees van Beers, Frances Brazier, Eva Kalmer (TNW), Reinhout Kleinhans (BK), and Oded Cats (CiTG).

Dissemination of Research

► Keynotes

- Designing Equitable Cities at Scale, Keynote at [The Academic Fringe Festival](#) in Delft, NL, Apr 2022.
- Self-fulfilling Prophecy of Smart Cities, Keynote at the [Conference 'Brave New World'](#) in Leiden, NL, Oct 2020.

► Invited Talks

- Invited Workshop on Designing the Future Together: Participatory Cities and Digital Governance at the Complexity Science Hub, Vienna, Sep 2023.
- Invited Talk at Geographic Data Science Lab, University of Liverpool, Feb 2023.
- AI and Society, Invited Panel Discussion, organised by Bosch Alumni Network, Germany, Feb 2023.
- Invited Talk at Urban Big Data Centre, University of Glasgow, Jan 2023.
- Invited Talk at the Sociology Seminar Series at Nuffield College, University of Oxford, Jan 2023.
- Building Smart Tools for Sustainable Cities, Invited Panel Discussion at the United Nations Innovation Technology Accelerator for Cities (UNITAC), organised by UN-Habitat, UN OICT and HafenCity University, Oct 2022.

- Urban Policy and Integrated Urban Development, Invited Talk at Resilience and Equity Workshop at the [World Urban Forum](#) in Katowice, Poland, June 2022.
- Urban Equity and Public Interest AI, Invited Workshop on AI and Public Interest at the Humboldt Institute for Internet and Society (HIIG) in Berlin, Germany, May 2022.
- How has digitalisation and big data changed urban research? Invited Workshop on New Collaborations in Urban Research at Brandenburgische Technische Universität Cottbus-Senftenberg in Berlin, Germany, May 2022.
- Invited Workshop on Critical Urban Research and Open-data at HafenCity Universität in Hamburg, Germany, May 2022.
- Panelist on the topic of “International University” at the Studium Generale at TU Delft, Sep 2021.
- Cities need Smart Planners, not Smart Tech, Invited Talk at the OneHot Data Science Community in Utrecht, NL, June 2021.
- Toward Equitable & Inclusive Cities, Invited Talk at the [TU Delft Global Seminars](#) in Delft, NL, May 2021.
- The Role of Big Data in Urban Science and Policy, Invited Talk at the Engineering and Policy Analysis Colloquium at TU Delft, May 2021.
- Cities are for Citizens, not Algorithms, Invited Talk at the Graduate School of Technology, Policy and Management faculty at TU Delft, Apr 2021.
- From Small to Big Data: Urban Science and Policy, Invited Talk at the [Centre for Entrepreneurship, SMEs, Regions and Cities, OECD](#) held online, Feb 2021.
- A Just and Sustainable Future, Invited Talk at the 179th Dies Natalis in Delft, NL, Jan 2021.
- Panelist on the topic of “Geospatial Data for Policy & Public Good” at Google’s Geo for Good Summit as part of their Google Earth Outreach Program, Oct 2020.
- Urbanisation and Policy in Cities, Invited Talk at the Spark Meetings at the Civil Engineering and Geosciences faculty of TU Delft, Nov 2019.
- Urban Sprawl and Public Transport Utilisation, Invited Talk at [The Alan Turing Institute](#) in London, UK, Aug 2019.

► Conference Presentations

- Evaluating Access to Solar Energy Policy, AAG in Denver, US, March 2023.
- Inequalities in Access to Urban Infrastructure, GISRUK in Liverpool University, the UK, April 2022. (Honorary mention for best presentation)
- Extracting Commuting Patterns from Mobility Data, 7th International Conference on Computational Social Science in ETH Zurich, July 2021.
- Inequalities in Access to Infrastructure, The 17th International Conference on Computational Urban Planning and Urban Management (CUPUM) in Aalto University, Helsinki, June 2021.
- The Spatiotemporal Geography of Cities, 6th International Conference on Computational Social Science in MIT, Massachusetts, July 2020.
- Measuring the Temporal Utility of Transport Infrastructure, The 8th International Conference on Complex Networks and Their Applications in Lisbon, December 2019.
- Transport Demand Inequalities, 5th International Conference on Computational Social Science in University of Amsterdam, July 2019.
- Structure and Dynamics of Transportation, 4TU DeSIRE conference on Resilience Engineering in University of Twente, June 2019.

Professional Service

▶ Scientific Evaluation Committees

- Hired by [Innoviris SDG](#) in Brussels to evaluate funded scientific projects, August 2020 and 2022.
- Reviewer of a proposal in the “Call in Environmental Systems Research” by the [Vienna Science and Technology Fund](#) August 2020.

▶ Program Committee and Editing

- PC Member 2nd KDD Workshop on Data-driven Humanitarian Mapping at ACM SIGKDD 2021.
- PC Member 31st ACM Conference on Hypertext and Social Media 2020.
- Guest Associate Editor for *Frontiers in Sustainable Cities*.
- Chair of the session Decision Making at the Technology, Management, and Policy Consortium at The George Washington University, DC, June, 2019, representing TU Delft.

▶ Journal Reviewing

- Plos One
- Nature Scientific Reports
- Nature Applied Sciences
- Physical Review Letters
- Multiple Elsevier Journals
- Physica A
- EPJ Data Science
- International Journal of Modern Physics C

▶ University Service

- Nominated for an education award to redesign *Engineering and Policy Analysis* Master Curriculum at TU Delft, 2022
- Part of mentorship program for Postdoc and PhD Researchers at TU Delft
- Serving on evaluation committees of PhD Candidates
- Co-Founder and Organizer of the Citizens Collective Series ([citizens-collective.org](#)), TU Delft, The Netherlands

Service Recognition and Awards

- Invited on the Task Force of Democracy Next to provide advice on Facilitating Citizen Assemblies for a new Urban Planning Model. [Democracy Next](#) is a non-profit action institute funded by OECD.
- Invited to provide scientific and strategic advice for the *Built-environment Vision* at the Municipality of The Hague, 2022.
- Teaching Excellence Award at TU Delft, 2021.
- Appointed to the [Teaching Academy Panel of TU Delft](#) and advisory group for Teaching and Learning Vision, Principles and Guidelines.
- Recognised with an Outstanding PC Member award at ACM Hypertext, 2020.

- National Geographic Teaching Fellowship (Jun 2018 – Present)
- ETH Zurich Fellowship in the flagship project titled “ETH48 Systemic Risk – Systemic Solutions” – CHF 200K
- TU Delft TopTalent Scholarship as an MSc student – 16K EURO

Professional Memberships/Affiliations

- Member of [Dutch Network Science Community](#).
- Affiliated with [4TU Resilience Engineering](#) in The Netherlands.