Dhruv Mittal M.Sc.

(+31) 0620577812
d.mittal@uva.nl

Education

Ph.D. in Compuatational Science — Amsterdam, Netherlands
Infomatics Institute, Universiteit van Amsterdam — 2021 - 2025 *(expected)*

- Promoter: Prof. Peter Sloot, Supervisor: Dr. Vitor Vasconcelos
- Research area: Complex systems, Behavioral economics

BS-MS Integrated Course (majoring in Physics) — Mohali, India
Indian Institute of Science Education and Research(IISER) — 2015 - 2020

- CPI: 8.9/10

Publications

1. **Mittal, D.**, Constantino, S. M., & Vasconcelos, V. V. (2024). Anticonformists catalyze societal transitions and facilitate the expression of evolving preferences. PNAS nexus, 3(8), pgae302.
2. **Mittal, D.**, López, F. G. N., Constantino, S. M., Shalvi, S., Chen, X., & Vasconcelos, V. V. (2025). Targeted incentives for social tipping in heterogeneous networked populations. arXiv preprint arXiv:2501.13623. (Submitted to PNAS, under revision)
3. **Mittal, D.**, Constantino, S. M., Levin, S.A., Sloot, P.M.A., Weber, E.U., & Vasconcelos, V. V. (2025). Policy, risk perceptions, and social norms shape collective mask-wearing behaviors worldwide. (draft under preparation)
4. **Mittal, D.**, Pinheiro, F.L., & Vasconcelos, V. V. (2025). Neutral theory of social behavior in complex networks. (draft under preparation)

Projects

Complexities of Social Dynamics: Computational approaches to understand Collective Behavior for effective stewardship
Doctoral research conducted at University of Amsterdam. 2021-25

Collective mask-wearing behavior worldwide during the COVID-19 pandemic
Research done as a Visiting Student Research Collaborator at Princeton University. 2024

The Cost of Large-Scale Transitions: Introducing Effective Targeted Incentives
Grant received under ENLENS RPA from the University of Amsterdam. 2024-25

Assessing Heat Stress and Heatwave events for the 21st century based on CMIP6 projections
in collaboration with MPI Chemistry, Mainz and IIT Ropar. 2021-22

Stability analysis of complex systems with non-autonomous perturbation
Research conducted in collaboration with IIT Ropar 2021

The emergence of polarization due to homophilic cooperation based on opinions
Independent project 2021

Proposed Study of Magnetic Thin Films Using Magnetocapacitance
Master's thesis project, IISER Mohali. 2019-20

Awards and Honors

- **All India Rank 3**, in Graduate Aptitude Test in Engineering (GATE) in Ecology and Evolution 2021
- **INSPIRE Scholarship**, Awarded by the Department of Science and Technology, Government of India. 2015-20
- **KVPY Scholarship**, Awarded by the Indian Institute of Science, Bangalore 2015
- **NTSE Scholarship**, awarded by the National Council of Education, Research and Training, New Delhi, 2013-15

Conferences

- **Anti-conformists can facilitate expression of preferences and accelerate societal transitions**, Presented at 'Economic Policy in Complex Environments' workshop, Venice. 2024
- **Social norms: Effects of heterogeneity and network topology on collective decision-making**, Presented at Complex Networks Conference, Aveiro. 2023

Workshops

- **Summer Institute in Computational Social Science**, Amsterdam, Netherlands. 2024
- **Stochastic Forecasting of Complex Systems**, Erice, Italy. 2022
- **Rate-Induced Transitions in Networked Systems**, Banff International Research Station, Canada 2022
- **Winter Workshop on Complex Systems**,Besançon, France 2022
- **Workshop on Statistical Techniques for AI and Data Science**, Indo-Taiwan Joint Research Centre on AI and ML at IIT Ropar, India 2019

Teaching and Supervision

- **Complex Systems Simulations**, Teaching Assistant, UvA. 2024-25
- **Complexity: Can It Be Simplified?**, Teaching Assistant, UvA. 2022
- **Modeling adoption of rooftop photovoltaics in the Netherlands.** Daily supervision for Master's Thesis, UvA. 2025
- **Heuristic strategies for cost-optimized institutional incentives in heterogeneous networked populations.** Daily supervision for Master's Thesis, UvA. 2024
- **A Digital Twin of Amsterdam's Social Network.** Daily supervision for Master's Thesis, UvA. 2022

Skills

Methods: Agent-Based Modeling, Systems Dynamics, Markov chain analysis, Statistical Analysis, High-Performance Computing.

Programming: `Python`, `MATLAB`, `R`.

Languages: English, Hindi.

Academic Services

Reviewer for: *International Conference on Computational Science* 2022-25

References

Available upon request