

DR CHARALAMPOS P. TRIANTAFYLLIDIS

Lecturer in Modelling for Global Health

Nuffield Department of Medicine, University of Oxford
Oxford OX3 7BN, United Kingdom

harry.triantafyllidis@ndm.ox.ac.uk

<https://www.ndm.ox.ac.uk/team/charalampos-triantafyllidis>



RESEARCH PROFILE

I develop and apply mathematical optimisation, graph-based machine learning, and mechanistic modelling methods to improve decision-making in healthcare and global health. My research focuses on causality-aware disease stratification, clinically relevant prediction, and constrained intervention optimisation using network representations, including graph neural networks. Current applications include cancer systems biology, hospital antimicrobial resistance, infectious disease modelling, and population-scale health data science.

RESEARCH EXPERTISE

Mathematical programming; network optimisation; graph neural networks; causal and mechanistic modelling; health data science; disease stratification; translational decision support.

ACADEMIC POSITIONS

University of Oxford, Oxford, UK

Lecturer in Modelling for Global Health, Nuffield Department of Medicine

Oct 2024 – Present

- Lead and deliver Data Science teaching for global health.
- Supervise M.Sc. research projects in health data science, modelling, and applied machine learning.
- Develop an independent interdisciplinary research programme combining optimisation, graph-based learning, and mechanistic modelling for clinically and policy-relevant decision support.

Goldsmiths, University of London, London, UK

Lecturer in Computer Science, Department of Computing

Oct 2023 – Oct 2024

- Led teaching for large cohorts (~200+) in Machine Learning and Algorithms I.
- Supervised five B.Sc. final-year research projects.

University of Greenwich, London, UK

Lecturer in Computer Science, School of Computing & Mathematical Sciences

Sep 2022 – Sep 2023

- Delivered teaching across large cohorts (~200) in Advanced Programming, Big Data, and Systems Design & Development.
- Supervised four B.Sc. theses and ten M.Sc. dissertations.

RESEARCH EXPERIENCE

Imperial College London, London, UK

- *MRC Early Career Research Fellow, School of Public Health*
Developed machine-learning methods for cardiopulmonary disease complications.

Jul 2021 – Aug 2022

- *Postdoctoral Research Associate, Centre for Process Systems Engineering*
Conducted research on network optimisation and modelling under sustainable-development constraints.

Mar 2015 – Apr 2016

University of Oxford, Oxford, UK

- *Senior Research Scientist, Department of Oncology*
Computational biology and integrative genomics lab: Conducted ERC-funded research on machine learning, data science, and network optimisation for cancer systems biology.

Apr 2019 – Jun 2021

- *Postdoctoral Researcher, Smith School of Enterprise and the Environment*
Contributed scientific software development and supervision for asset-risk modelling under sustainable-development constraints.

Jun 2018 – Mar 2019

University College London, London, UK

Postdoctoral Research Associate, Centre for Process Systems Engineering

May 2016 – Jun 2018

Developed scientific software and mathematical modelling methods across multiple classes of optimisation problems.

FELLOWSHIPS & DISTINCTIONS

MRC Early Career Research Fellowship, School of Public Health, Imperial College London.

Honorary Research Associate, School of Public Health, Faculty of Medicine, Imperial College London.

Ranked within the top 5% nationally among 69,498 candidates in the Greek university-entry examinations (2000).

TEACHING & SUPERVISION

University of Oxford: Data Science teaching for global health; supervision of M.Sc. research projects.

Goldsmiths, University of London: Machine Learning and Algorithms I; supervision of five B.Sc. final-year projects.

University of Greenwich: Advanced Programming, Big Data, and Systems Design & Development; supervision of four B.Sc. theses and ten M.Sc. dissertations.

- [1] **Triantafyllidis, C.P.**, Aguas, R. *A digital twin for hospital antimicrobial resistance forecasting and constrained intervention optimisation*. medRxiv preprint (2026). <https://doi.org/10.64898/2026.05.15.26353296>
- [2] **Triantafyllidis, C.P.**, Aguas, R. *Causality-aware graph neural networks for functional stratification and phenotype prediction at scale*. npj Systems Biology and Applications 11(1), 92 (2025). <https://doi.org/10.1038/s41540-025-00567-1>
- [3] **Triantafyllidis, C.P.**, Barberis, A., Hartley, F., Cuervo, A.M., Gjerga, E., Charlton, P., Van Bijsterveldt, L., Rodriguez, J.S., Buffa, F.M. *A machine learning and directed network optimization approach to uncover TP53 regulatory patterns*. iScience 26(12) (2023). <https://doi.org/10.1016/j.isci.2023.108291>
- [4] Garmendia, A.T., Gkouzionis, I., **Triantafyllidis, C.P.**, Dimakopoulos, V., Liliopoulos, S., Vuckovic, D., Paseiro-Garcia, L., Chadeau-Hyam, M. *Towards personalised early prediction of intra-operative hypotension following anesthesia using deep learning and phenotypic heterogeneity*. medRxiv preprint (2023).
- [5] Winchester, L., van Bijsterveldt, L., Dhawan, A., Wigfield, S., **Triantafyllidis, C.**, Haider, S., McIntyre, A., Humphrey, T.C., Harris, A.L., Buffa, F.M. *Multi-omic profiling identifies a Dicer-to-Argonaute switch controlling biogenesis of oncogenic miRNA*. bioRxiv preprint (2021).
- [6] **Triantafyllidis, C.P.**, Samaras, N. *A new non-monotonic infeasible simplex-type algorithm for linear programming*. PeerJ Computer Science 6, e265 (2020). <https://doi.org/10.7717/peerj-cs.265>
- [7] Wang, X., van Dam, K.H., **Triantafyllidis, C.**, Koppelaar, R.H.E.M., Shah, N. *Energy-water nexus design and operation towards the sustainable development goals*. Computers & Chemical Engineering 124, 162–171 (2019).
- [8] Bieber, N., Ker, J.H., Wang, X., **Triantafyllidis, C.**, van Dam, K.H., Koppelaar, R.H.E.M., Shah, N. *Erratum to “Sustainable planning of the energy-water-food nexus using decision making tools” [Energy Policy 113 (2018) 584–607]*. Energy Policy 116, 289 (2018).
- [9] **Triantafyllidis, C.P.**, Koppelaar, R.H.E.M., Wang, X., van Dam, K.H., Shah, N. *An integrated optimisation platform for sustainable resource and infrastructure planning*. Environmental Modelling & Software 101, 146–168 (2018).
- [10] **Triantafyllidis, C.P.**, Papageorgiou, L.G. *An integrated platform for intuitive mathematical programming modeling using \LaTeX* . PeerJ Computer Science 4, e161 (2018). <https://doi.org/10.7717/peerj-cs.161>
- [11] Bieber, N., Ker, J.H., Wang, X., **Triantafyllidis, C.**, van Dam, K.H., Koppelaar, R.H.E.M., Shah, N. *Sustainable planning of the energy-water-food nexus using decision making tools*. Energy Policy 113, 584–607 (2018).
- [12] Wang, X., Guo, M., Koppelaar, R.H.E.M., van Dam, K.H., **Triantafyllidis, C.P.**, Shah, N. *A nexus approach for sustainable urban energy-water-waste systems planning and operation*. Environmental Science & Technology 52(5), 3257–3266 (2018).
- [13] Koppelaar, R.H.E.M., Sule, M.N., Kis, Z., Mensah, F.K., Wang, X., **Triantafyllidis, C.**, van Dam, K.H., Shah, N. *Framework for WASH sector data improvements in data-poor environments, applied to Accra, Ghana*. Water 10(9), 1278 (2018).
- [14] Caldecott, B., McCarten, M., **Triantafyllidis, C.** *Carbon lock-in curves and Southeast Asia: Implications for the Paris Agreement*. Briefing paper (2018).
- [15] Wang, X., van Dam, K.H., **Triantafyllidis, C.**, Koppelaar, R.H.E.M., Shah, N. *Water and energy systems in sustainable city development: A case of Sub-Saharan Africa*. Procedia Engineering 198, 948–957 (2017).
- [16] Wang, X., Guo, M., van Dam, K.H., Koppelaar, R.H.E.M., **Triantafyllidis, C.**, Shah, N. *Waste-energy-water systems in sustainable city development using the resilience.io platform*. In *Computer Aided Chemical Engineering*, vol. 40, pp. 2377–2382 (2017).
- [17] Dominguez-Ramos, A., **Triantafyllidis, C.**, Samsatli, S., Shah, N., Irabien, A. *Renewable electricity integration at a regional level: Cantabria case study*. In *Computer Aided Chemical Engineering*, vol. 38, pp. 211–216 (2016).
- [18] **Triantafyllidis, C.**, Samaras, N. *Three nearly scaling-invariant versions of an exterior point algorithm for linear programming*. Optimization 64(10), 2163–2181 (2015). <https://doi.org/10.1080/02331934.2014.926356>
- [19] Samaras, N., Sifelaras, A., **Triantafyllidis, C.** *A primal-dual exterior point algorithm for linear programming problems*. Yugoslav Journal of Operations Research 19(1), 123–132 (2009).
- [20] Paparrizos, K., Samaras, N., **Triantafyllidis, C.** *A computational study of exterior point simplex algorithm variations*. Proceedings of the 20th Hellenic Operational Research Society, 777–785 (2008).

University of Macedonia, Greece

B.Sc., M.Sc., and Ph.D. in Applied Computer Science.

Ph.D. thesis: *A non-monotonic infeasible interior-exterior point algorithm for Linear Programming* (January 2014).

Thesis co-advised by the Massachusetts Institute of Technology, USA ([John N. Tsitsiklis](#))