

RESEARCH PROFILE I develop and apply advanced optimisation and graph-based machine learning methods to improve decision-making in healthcare and global health. My work focuses on disease phenotyping and functional stratification at scale, causality-aware modelling, and clinically relevant prediction using network representations (including graph neural networks). Applications include cancer networks, population-scale phenotyping and digital twins for antimicrobial resistance. **Methods:** mathematical programming; network optimisation; causal modelling; graph neural networks; translational health data science.

EDUCATION **B.Sc., M.Sc., Ph.D. in Applied Computer Science, University of Macedonia, Greece**
Thesis (co-advised by MIT, USA): *A non-monotonic infeasible interior-exterior point algorithm for Linear Programming* (January 2014).

DISTINCTIONS Top 5% in Greece among 69,498 candidates (BSc Entry Nation-Wide Assessment, July 2000).
Honorary Research Associate, School of Public Health, Faculty of Medicine, Imperial College London.

ACADEMIC POSITIONS **University of Oxford, Oxford, UK**
Lecturer in Modelling for Global Health, Nuffield Department of Medicine Oct 2024 – Present

- Module lead and teaching delivery (Data Science).
- Supervision of M.Sc. theses.

Goldsmiths, University of London, London, UK
Lecturer in Computer Science, Department of Computing Oct 2023 – Oct 2024

- Module lead across large cohorts (~200+): Machine Learning (online), Algorithms I
- Supervised 5 B.Sc. final-year projects.

University of Greenwich, London, UK
Lecturer in Computer Science, School of Computing & Mathematical Sciences Sept 2022 – Sept 2023

- Teaching across large cohorts (~200): Advanced Programming, Big Data, Systems Design & Development, and related modules.
- Supervised 4 B.Sc. theses and 10 M.Sc. dissertations.

RESEARCH EXPERIENCE **Imperial College London, London, UK**

- *School of Public Health, MRC Early Career Research Fellow* Jul 2021 – Aug 2022
Machine learning for cardiopulmonary disease complications.
- *Centre for Process Systems Engineering, Postdoctoral Research Associate* Mar 2015 – Apr 2016
Network optimisation and modelling under sustainable development constraints.

University of Oxford, Oxford, UK

- *Computational biology and integrative genomics lab, Senior Research Scientist* Apr 2019 – Jun 2021
ERC microC: Machine learning/data science and network modelling/optimisation for cancer networks.
- *Smith School of Enterprise, Postdoctoral Researcher* Jun 2018 – Mar 2019
Software engineering supervision for asset risk management under sustainable development.

University College London, London, UK
Centre for Process Systems Engineering, Postdoctoral Research Associate May 2016 – Jun 2018
Scientific software development for mathematical modelling of multiple classes of optimisation problems.

SELECTED PUBLICATIONS

- [1] **Triantafyllidis, C.P.**, Aguas, R. *Causality-aware graph neural networks for functional stratification and phenotype prediction at scale.* npj Systems Biology and Applications 11, 92 (2025). <https://doi.org/10.1038/s41540-025-00567-1>
- [2] **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 optimization approach to uncover TP53 regulatory patterns.* iScience (2023). <https://doi.org/10.1016/j.isci.2023.108291>
- [3] **Triantafyllidis, C.P.**, Samaras, N. *A new non-monotonic infeasible simplex-type algorithm for Linear Programming.* PeerJ Computer Science 6:e265 (2020). <http://doi.org/10.7717/peerj-cs.265>
- [4] **Triantafyllidis, C.P.**, Papageorgiou, L.G. *An integrated platform for intuitive mathematical programming modeling using L^AT_EX.* PeerJ Computer Science (2018). <https://doi.org/10.7717/peerj-cs.161>
- [5] **Triantafyllidis, C.P.**, Koppelaar, R., Wang, X., van Dam, K.H., Shah, N. *An integrated optimisation platform for sustainable resource and infrastructure planning.* Environmental Modelling & Software 101C, 146–168 (2018).