Efthymios Costa

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EDUCATION

PhD in Statistics and Machine Learning (StatML)   *Oct 2021 - Sep 2025*
Imperial College London, Department of Mathematics
Supervisors: Dr Ioanna Papatsouma & Professor Alastair Young
Thesis title: *Novel unsupervised techniques for mixed-type data*

Visiting Doctoral Student   *Jan - Mar 2024*
University of Bologna, Department of Statistical Sciences "Paolo Fortunati"
Visiting Supervisor: Professor Christian Martin Hennig

MSc Statistics (Data Science)   *Sep 2020 - Sep 2021*
Imperial College London, Department of Mathematics   Distinction (80.89/100)
Thesis: "A benchmarking study of distance-based clustering methods for mixed-type data"

BSc Mathematics   *Sep 2017 - Jun 2020*
Imperial College London, Department of Mathematics   First Class Honours (78.21/100)

EMPLOYMENT

Research Associate with Teaching Duties in Statistics   *Oct 2025 - Present*
Imperial College London, Department of Mathematics   London, United Kingdom
Postdoc & Fellows Representative in the Department of Mathematics

Research Intern   *Jun - Aug 2020*
The Cyprus Institute, Climate & Atmosphere Research Centre   Nicosia, Cyprus
Project title: "Climate Impacts on Vector-borne Diseases: Integrating Environmental
Drivers to the Mathematical Models of Vector Populations"

Advisory, Data Analytics Intern   *Jun - Jul 2019*
PwC Cyprus   Nicosia, Cyprus

RESEARCH INTERESTS

Unsupervised learning: Cluster analysis, outlier detection, dimensionality reduction.

Mixed-type data: Combination of continuous and discrete variables in data.

Robust statistics: Robustness guarantees for machine learning methodologies.

PUBLICATIONS & PREPRINTS

Efthymios Costa, Christian Martin Hennig (2026). "A unified approach to outlier identification for mixed-type data" *(manuscript in preparation)*.

Efthymios Costa, Ioanna Papatsouma (2025). "A novel framework for quantifying nominal outlyingness". In: *Statistics and Computing* 36, pp. 41–58.

Efthymios Costa, Ioanna Papatsouma (2025) Contribution to the discussion of Dümbgen and Davies (2025) "Connecting Model-Based and Model-Free Approaches to Linear Least Squares Regression". In: *Statistica* 84, pp. 107–108.

Efthymios Costa, Ioanna Papatsouma, Angelos Markos (2024). "A Deterministic Information Bottleneck Method for Clustering Mixed-Type Data". *arXiv preprint arXiv:2407.03389.*

Efthymios Costa, Ioanna Papatsouma (2023). "Outlier detection for mixed-type data: A novel approach". *arXiv preprint arXiv:2308.09562.*

Efthymios Costa, Ioanna Papatsouma, Angelos Markos (2022). "Benchmarking distance-based partitioning methods for mixed-type data". In: *Advances in Data Analysis and Classification* 17, pp. 701—724.

Funding & Awards

Poster Competition 1st Place & People's Choice Award
Faculty of Natural Sciences Research Showcase 2025, Imperial College London

Poster Competition People's Choice Award
Mathematics PhD Symposium 2025, Imperial College London

Best Postgraduate/Doctoral Paper Award
6th Annual Conference of the Cyprus Statistical Society, 2025

Faculty of Natural Sciences Prize for Excellence in Teaching
Highly commended nomination for excellence in teaching and learning, 2025, Imperial College London

MSc in Statistics Imperial College London Ambassador
Honorary title in recognition of outstanding contributions to the running and delivery of the programme

Poster Competition Runner-up & People's Choice Award
Mathematics PhD Symposium 2022, Imperial College London

PhD Studentship
EPSRC Centre for Doctoral Training (CDT) in Statistics and Machine Learning (StatML)

Warner Prize
Prize awarded for research project development in the MSc in Statistics at Imperial College London - Class of 2021

Outstanding Academic Representation Network Team Award
Student volunteer award - Imperial College Union Student Choice Awards 2020

Qualifications

Associate Fellow of Advance HE (AFHEA)
Awarded on February 2024, Imperial College London

Conferences, Workshops & Seminars

19th International Conference on Computational and Methodological Statistics	*13 - 15 Dec 2025*
Session Title: "Clustering of heterogeneous data"	Session Organiser/Chair
Joint meeting of the Italian and Dutch/Flemish Classification Societies (CLADAG-VOC 2025)	*8 - 10 Sep 2025*
Presentation title: "Cluster Analysis from an Information-Theoretic Viewpoint"	Invited Speaker
International Conference on Robust Statistics (ICORS 2025)	*19 - 23 May 2025*
Presentation title: "A novel framework for quantifying nominal outlyingness"	Invited Speaker
18th International Conference on Computational and Methodological Statistics	*14 - 16 Dec 2024*
Presentation title: "A Deterministic Information Bottleneck Method for Clustering Mixed-Type Data"	Presenter
RSS Emerging Applications Section Meeting "Network and Clustering Analysis for Emerging Applications"	*13 Dec 2024*
Presentation title: "A Deterministic Information Bottleneck Method for Clustering Mixed-Type Data"	Invited Speaker
UKRI EPSRC Mathematical Sciences Team visit at Imperial College London	*9 Oct 2024*
Poster title: "A Deterministic Information Bottleneck Method for Clustering Mixed-Type Data"	Presenter
18th Conference of the International Federation of Classification Societies	*16 Jul 2024*
Presentation title: "A Deterministic Information Bottleneck Method for Clustering Mixed-Type Data"	Presenter
Imperial Mathematics PhD Symposium	*12 Jun 2024*
Poster title: "A Novel Approach to Outlier Detection for Mixed-Type Data"	Presenter
Department of Statistical Sciences "Paolo Fortunati", University of Bologna - Weekly Statistics Seminars	*1 Feb 2024*
Presentation title: "Outlier detection for mixed-type data: A novel approach"	Presenter
16th International Conference on Computational and Methodological Statistics	*16 - 18 Dec 2023*
Poster title: "A novel approach to outlier detection for mixed-type data"	Presenter
Amazon Development Center Germany GmbH	*27 - 28 Mar 2023*
Advanced training on Statistical Machine Learning and Computing for big-data analysis	Attendee
Poster title: "Benchmarking distance-based partitioning methods for mixed-type data"	Presenter

Faculty of Natural Sciences Research Showcase 2022	*29 Sep 2022*
Presentation title: "Clustering mixed-type data: Which method to choose?"	Presenter
Bocconi Summer School in Advanced Statistics & Probability	*11 - 22 Jul 2022*
Topic: Random Structures and Combinational Statistics	Attendee
Imperial Mathematics PhD Symposium	*16 Jun 2022*
Poster title: "A full factorial benchmarking study of non-parametric partitioning methods for mixed-type data"	Presenter

TEACHING EXPERIENCE

BSc/MSci Mathematics Final Year Project Supervisor
Imperial College London, Department of Mathematics (Academic Year 2025-2026)

MSc Statistics Dissertation Supervisor
Imperial College London, Department of Mathematics (Academic Year 2025-2026)

Senior Graduate Teaching Assistant
Probability and Statistics - BSc/MSci Mathematics Year 1 (Autumn 2024)
Probability for Statistics - BSc/MSci Mathematics Year 2 (Autumn 2022)
Imperial College London, Department of Mathematics

Statistics - MEng Mechanical Engineering Year 3/4 (Autumn 2023)
Imperial College London, Department of Mechanical Engineering

Graduate Teaching Assistant
Data Science - MSc Statistics (Spring 2022)
Computational Statistics - MSc Statistics (Autumn 2022, 2023 & 2024)
Unsupervised Learning - MSc Machine Learning and Data Science (Autumn 2022)
Deep Learning, Supervised Learning - MSc Machine Learning and Data Science (Spring 2023)
Machine Learning - MSc Statistics (Spring 2023)
Introduction to Statistical Learning, Statistical Modelling II - BSc/MSci Mathematics Year 3/4 (Spring 2023)
Statistical Modelling I - BSc/MSci Mathematics Year 2 (Spring 2023)
Imperial College London, Department of Mathematics

OUTREACH

Mentor for Imperial College London Mathematics School Research Project (2024 - 2025)

EDITORIAL & PEER-REVIEW SERVICE

Reviewer

Advances in Data Analysis and Classification
International Statistical Review
Journal of Classification

MEMBERSHIPS

Fellow of the Royal Statistics Society (RSS)

Member of the Cyprus Statistics Society (CSS)

SKILLS

Programming/IT: R (Advanced/Preferred), Python (Intermediate), C++ (Basic), MATLAB (Basic), LaTeX, HPC projects on compute clusters, Office 365

Languages: Greek (native), English (fluent), French (proficient)