


Aston University

BIRMINGHAM UK



DEA Workshop Program

Efficiency and Productivity Assessment in
Higher Education and Public Services: DEA,
Machine Learning, and AI

16-17 April 2026

Aston Business School, Birmingham, UK

Welcome

Dear Participants,

Welcome to the Data Envelopment Analysis (DEA) Workshop on Efficiency and Productivity Assessment in Higher Education and Public Services: DEA, Machine Learning, and AI.

Improving efficiency in higher education and public services has become increasingly important, particularly in the UK, where institutions face financial pressures, regulatory demands, and growing expectations for accountability and value for money. While efficiency analysis has gained significant attention, translating results into actionable insights remains challenging due to complex production processes, data limitations, and the nature of non-market outputs.

Recent advances in machine learning, combined with performance analytics methods such as DEA and Stochastic Frontier Analysis (SFA), provide new opportunities to enhance modelling, uncover patterns, and support decision-making. At the same time, they raise important questions around interpretability, robustness, and policy relevance.

This workshop, organised by Aston Business School and the Centre for Business Analytics in Practice at the University of Surrey, provides a platform for researchers, practitioners, and early-career scholars to share ideas, present new methods, and discuss both theoretical and applied developments in DEA, AI, and related approaches, with a focus on higher education and public services.

We thank our speakers, contributors, and participants for making this event possible.

Welcome, and we wish you a productive and engaging workshop.

Organisers: Akram Dehnokhalaji, Ali Emrouznejad, Majid Azadi, Helen Higson

Organisers:



Aston Business School, part of Aston University, is a leading international business school with a long-standing reputation for research excellence, industry engagement, and impactful education. Its origins date back to 1947 with the establishment of the Department of Industrial Administration at the former Birmingham Central Technical College, making it one of the earliest centres for business and management education in the UK. Since then, the school has evolved into a globally recognised institution, emphasising the integration of academic rigour with real-world application. Located in Birmingham, Aston Business School is particularly known for its strengths in business analytics, operations management, finance, and digital innovation. It is among a small group of business schools worldwide to hold triple accreditation (AACSB, AMBA, and EQUIS), reflecting the quality and global relevance of its teaching and research. The School maintains strong links with industry and policy communities, supporting evidence-based decision-making and delivering research that addresses key societal challenges, including productivity, sustainability, and the effective management of public services.



The **Centre for Business Analytics in Practice (CBAP)** is a multi-disciplinary research centre with the vision of using analytics for better decision-making. We are focused on theoretically driven, empirically rigorous research in these fields, particularly around their applications outside academia. Our Centre brings together research into the methods and applications in key areas, including Business analytics, AI and big data, Health analytics, Operations and supply chain analytics, Sustainability and net-zero analytics. Driven by business and societal needs, decision analytics has become one of the most active research areas in academics and in industry. The tools, techniques, and algorithms used for big data projects leverage the most current, state-of-the-art methods applied in a wide variety of fields that include business and management science, computer science, statistics, data science, engineering, and mathematics.

Organising Committee



Akram Dehnokhalaji, *Senior Lecturer, Aston University*

Akram Dehnokhalaji is a senior lecturer in business analytics at Aston University. She has a PhD in Operations Research and experience of working for more than 15 years on applying Data Envelopment Analysis and Multi-criteria Decision-Making techniques in Higher Education, Healthcare, and Industry. He is a member of Crisis Management Research Centre and the centre of Artificial Intelligence Research and Application at Aston University. Akram has several publications in top OR journals such as EJOR, JORS, ANOR, NLR, Transp. Res. etc.



Ali Emrouznejad, *Professor, University of Surrey*

Ali Emrouznejad is a Professor and Chair in Business Analytics at Surrey Business School, UK. He also serves as the director of the Centre for Business Analytics in Practice, leading research efforts in various fields, including performance measurement and management, efficiency and productivity analysis, as well as AI and big data. He has served as an editor, associate editor, or guest editor for several journals, including the *Annals of Operations Research*, *European Journal of Operational OR Spectrum*, and the *IMA Journal of Management Mathematics*.



Majid Azadi, *Lecturer, Aston University*

Majid Azadi is a of lecturer of Business Analytics at Aston Business School, and Associate Editor of the IMA Journal of Management Mathematics. He received his PhD from the University of Technology Sydney in 2021 and was awarded the Alfred Deakin Postdoctoral Research Fellowship at Deakin University. His research focuses on business analytics, operations research, and sustainable supply chains, with over 60 publications in leading journals such as European Journal of Operational Research and Decision Support Systems.



Helen Higson, *Professor, Aston University*

Helen Higson is Professor of Education and Deputy Dean Academic at Aston Business School, Aston University. She is a National Teaching Fellow and Principal Fellow of Advance HE, with extensive experience in higher education leadership, curriculum design, and student success. Her research focuses on accounting education, assessment, and student experience, with a particular interest in enhancing employability and inclusive learning. Professor Higson has played a key role in shaping educational strategy and innovation at Aston and contributes actively to national and international discussions on higher education policy and practice.

Invited Speakers



Victor Podinovski, *Professor, University of Loughborough, UK*

Victor Podinovski is Professor of Operational Research at School of Business and Economics of Loughborough University. Victor's background is in applied mathematics and operational research, and he has previously worked as Professor of Operational Research at Warwick Business School. Victor's academic interests are in the areas of optimisation, decision making and efficiency analysis of firms. He has published extensively on these topics in many international journals, including top European and US journals. He is a co-editor of Journal of Productivity Analysis and co-director of the Centre for Performance and Productivity Analysis at Loughborough University.



Grammatoula Papaioannou, *Senior Lecturer, University of Loughborough, UK*

Grammatoula is a Senior Lecturer in Business Analytics at Loughborough Business School, Loughborough University. Her current research and teaching include various areas of optimisation, efficiency analysis of firms and supply chain management. Grammatoula has published and has been involved in the editorial and refereeing work for many leading international journals. She has presented her research at numerous UK and international conferences and is currently involved in a major ESRC/UKRI grant investigating sustainability of global supply chains.



Kristiaan Kerstens, *Professor, IESEG School of Management, France*

Kristiaan Kerstens is a Research Director at the French National Centre for Scientific Research (CNRS) and a Professor at IESEG School of Management. He has published over 100 peer-reviewed articles in top-tier journals including Management Science and Operations Research (4*). His contributions span data envelopment analysis, productivity indices, portfolio optimisation, and public economics. With an h-index of 40 and recognition by RePEc as among the top 10% of economists globally, his work has shaped both academic research and policy practice. Drawing on extensive international experience across Europe, Asia, and North America, Professor Kerstens brings deep insight and thought leadership to our community.

How to reach

The workshop will be held in Room G8 Main building, Aston University, B4 7ET.

Bike:

If you are planning to cycle to Aston University, you can plan your route using [CycleStreets](#).

There are bike shelters on campus and changing facilities are available.

By Car:

Participants travelling by car should use the postcode B4 7ET for SatNav. Aston University is accessible via major routes including the M6 (Junction 6, Aston Expressway), the M5 (Junction 3, Hagley Road), and the M42 (Junction 6, Coventry Road). It is recommended to follow local signage or detailed directions once near the campus, as the postcode may lead to the wider university area rather than a specific car park.

On-campus parking is available for visitors in designated areas. Car Park 5 (Holt Street, B7 4BH) is available daily between 6am and 10pm for a fixed fee.

We recommend you visit JustPark, where you can find the nearest available parking, get costs, reserve spaces (where applicable) and pay online.

[Google maps: Directions](#)

By Plane:

The nearest airport is [Birmingham International airport](#).

A free shuttle service runs regularly between Birmingham International airport and Birmingham International train station, and takes less than 10 minutes.

By Public Transport:

Participants travelling by public transport have several convenient options to reach Aston University. Those travelling by bus can access numerous services that stop close to campus; timetable information is available from Transport for West Midlands.

For coach travel, services operated by National Express arrive at Birmingham Coach Station in Digbeth, which is approximately a 20-minute walk to the University through the city centre.

If travelling by train, the nearest stations are Birmingham New Street, Snow Hill, and Moor Street, all located around 10–15 minutes' walk from campus. Train times and routes can be checked via National Rail.

Participants travelling by tram can use the West Midlands Metro. The nearest tram stops are Bull Street, Corporation Street, and Grand Central/New Street, each approximately 6–10 minutes' walk from the University.

Aston University buildings

- 1 Main Building and reception
- 2 South Wing (Main Building)
- 3 North Wing (Main Building)
- 4 Aston Students' Union - The Adrian Cadbury Building
- 5 Aston Business School and Conference Centre
- 6 Aston Library
- 7 Aston University Day Hospital
 - Optegra
 - BCH Cochlear
- 8 IHN - Institute of Health and Neurodevelopment
- 9 Vision Sciences
 - Aston Eye Clinic and Aston Optometry School
 - Audiology Department and Audiology Clinics
- 10 Sir Doug Ellis Woodcock Sports Centre and pool
- 11 Gosta Green five-a-side pitch
- 12 Greater Birmingham and Solihull Institute of Technology (GBSioT)
- 13 Sports pitch
- 14 Aston University Nursery and Pre-school
- 15 Energy & Bioproducts Research Institute (EBRI)
- 16 Martin Luther King Multi-Faith Centre
- 17 John Cadbury House, One Aston (Corporation Street)
- 18 Aston University Engineering Academy

Student accomodation

- 19 Residences reception
- 20 Harriet Martineau Residences
- 21 Mary Sturge Residences
- 22 James Watt Residences
- 23 William Murdoch Residences
- 24 Lakeside Residences

Campus car parking

- 25 Car Park 1
- 26 Car Park 2
- 27 Car Park 3 (unloading)
- 28 Car Park 4
- 29 Car Park 5 (accessed from Holt St)
- 30 Car Park 7 (permit holders only)
- 31 Car Park 6 (evenings and weekends)
- 32 Car Park 12 (underground car park)
- 33 Car Park (Millennium Point pay parking)

Other buildings

- 34 Sacks of Potatoes pub
- 35 Gosta Green pub
- 36 Innovation Birmingham Campus
- 37 Birmingham City Council offices
- 38 The Eastside Rooms
- 39 Birmingham Metropolitan College
- 40 The Old Fire Station
- 41 Shops on campus
 - Tesco Express
 - Costa Coffee
 - Rio's Piri Piri
 - Wok & Go
 - Greggs



Registration Information

When	Where
Day 1 - 10:30 - 11:00 Day 2 - 08:30 - 09:00	Room G8 – Main building of Aston University, B4 7ET

All participants are required to register at the registration desk before attending the sessions.

Name badges

A name badge is provided at the registration desk and must be visible and worn at all sessions and social events throughout the workshop.

Parking

On-campus parking is available for visitors in designated areas. Car Park 5 (Holt Street, B7 4BH) is available daily between 6am and 10pm for a fixed fee.

Conference Dinner:

Thursday 16th April 2026 (18:30-21:00)

The dinner will be at Conference Aston Hotel.

Remarks for Presentations

- There are different numbers of speakers in sessions. Please split the session time equally between each speaker, while allowing 2–3 minutes allocated for speaker transitions.
- Speakers: please bring your paper presentations on a pre-loaded memory stick to your sessions.
- The last presenter in each session will also serve as the session chair.
- Session chairs are responsible for introducing the speakers at the beginning of the session.
- As a speaker, please arrive at least 15 minutes before your session starts. This will give you time to check-in with the session chair and set up your computer and projector.
- Attendees are kindly requested to switch off cell phones and mobile devices prior to the start of the presentations.

Program - Overview

Day 1 - Thursday 16th April 2026

Arrival & Registration

Room G8 – Main building, Aston University

11:00-12:30 **Presentations**

12:30-13:30 **Lunch and Refreshments**

13:30- 15:00 **Presentations**

15:00-15:30 **Coffee Break**

15:30-17:30 **Presentations**

18:30-21:00 **Dinner at Conference Aston Hotel**

Day 2 - Friday 17th April 2025

08:30-09:00 **Registration**
Room G8 – Main building, Aston University

09:00-10:30 **Presentations**

10:30-11:00 **Coffee Break**

11:00-12:30 **Presentations**

12:30-13:30 **Lunch and Refreshments**

13:30- 15:00 **Presentations**

15:00-15:30 **Coffee Break**

15:30-16:00 **Closing Session**

Detailed Programme

Day 1 - Thursday 16th April 2026	
11:00-11:15	Welcome Speech Akram Dehnokhalaji* (Aston University) Ali Emrouznejad* (University of Surrey)
11:15-12.30	Two unresolved modelling issues with production trade-offs and weight restrictions in DEA Victor Podinovski* (Loughborough Business School)
	Decomposing courts efficiency using DEA Grammatoula Papaioannou* (Loughborough Business School); Panagiotis Ravanos (European Commission, Joint Research Centre (JRC)); Giannis Karagiannis (University of Macedonia); Victor Podinovski (Loughborough Business School)
12:30-13:30	Lunch and Refreshments
13.30-15:00	Usage and satisfaction of GenAI amongst students and educators in quantitative disciplines Dimitris Giraleas* (University College London)
	AI-Generated Learner Traces and Assessment Evidence: Rethinking Efficiency Measurement in Project-Based Higher Education Jing Jiang* (The University of Manchester); Amir Rahbarimanesh (The University of Manchester); Rashid Maqbool (The University of Manchester); Tao Song (Beijing Normal University)
	Variable RTS in hierarchical network DEA: Enhancing efficiency in higher education systems Siwei Xiao* (University of Birmingham); Marios Kremantzis (University of Bristol); Leonidas Kyrgiakos (University of Thessaly); Aniekan Essien (University of Bristol); George Vlontzos (University of Thessaly)
15:00-15:30	Coffee break
15:30-17:00	A Unified Linearisation Framework for Non-Linear Structures in Advanced DEA and Optimisation Models Mehdi Toloo* (University of Surrey)
	Handling Ratio Measures in DEA: A Logarithmic Transformation Approach Maria Michali* (University of Bristol); Gholam Reza Amin (University of New Brunswick); Ali Emrouznejad (University of Surrey);
	A Copula-Based Framework for Identifying Congestion in Data Envelopment Analysis Zakiatul Wildani* (University of Bristol); Maria Michali (University of Bristol); Bangdong Zhi (University of Bristol); Ming Luo (University of Bristol)
18:30-21:00	Dinner at Conference Aston Hotel

Day 2 - Friday 17th April 2025

9:00-10:30	<p>Frontier Regulation of Electricity Distribution: Why Economists Are Wrong and Engineers Are Only Half Right Kristiaan Kerstens* (IESEG School of management); Stefano Nasini (IESEG School of Management); Miguel Alves Pereira (CEGIST, Instituto Superior Técnico, Universidade de Lisboa)</p> <p>Identifying and Prioritising Risk and Trust Concerns in Mobile Banking Reviews: A Topic Modeling and DEA Approach Abdolreza Roshani* (University of Surrey)</p>
10:30-11:00	Coffee Break
11:00-12:30	<p>Network DEA Framework for Efficiency Analysis of Universities Across Economic, Teaching, and Research Dimensions Akram Dehnokhalaji (Aston University); Oleg Badunenko (University of Brunel); Helen Higson (Aston University)</p> <p>Assessing Groundwater Safety Efficiency District-Wise in Bangladesh – A Data Envelopment Analysis (DEA) Study Honey Yadav (Business School, Birmingham City University)*; Shishank Shishank (Business School, Birmingham City University); Navjot Sandhu (Birmingham City University); Lynsey Melville (Birmingham City University); Florimond Gueniat (Birmingham City University); Cham Athwal (Birmingham City University); Sandeep Dhundhara (Birmingham City University); Khondokar Mizanur Rahman (Birmingham City University); Mohammad Rakib Hussain Khan (Water and Sanitation for Urban Population)</p>
12:30-13:30	Lunch and Refreshments
13:30-15:00	<p>Decarbonization under cap-and-trade: An integrated network DEA model with a second-score auction mechanism Elnaz Azadi* (University of Surrey); Ali Emrouznejad, (University of Surrey); Xun Zhou.</p> <p>Merger and Reconfiguration in Supply Chain Design: A General Non-Convex Production Technology Framework with an Application to AI-Data Supply Chains Chixiao Lu* (University of Surrey); Glenn Parry (University of Surrey); Eugenio Felipe Merlano (University of Surrey)</p> <p>Circular Disposability in DEA: A Structural Framework for Modelling Circular Economy Systems Behrouz Arabi* (University of Birmingham); Sonal Choudhary (University of Birmingham)</p>
15:00-15:30	Coffee Break
15:30-16:00	Closing Session