Lyn Thomas Impact Medal – Previous Winners

2024 – Bart Baesens

2022 – Navonil Mustafee, John H. Powell, Alison Harper, Todd R Kaplan, Surajeet Chakravarty, Susan Martin and Andrew Fordyce

2021 – Paul Harper, Izabela Spernaes, Daniel Gartner, Tracey England, Doris Behrens, Vincent Knight, Geraint Palmer, Mark Tuson, Sue Bale

2019 – Sonya Crowe, Christina Pagel, and Martin Utley

Seymour House, 12 Edward Street, Birmingham, B1 2RX
◆ +44(0)121 233 9300 ◆ email@theorsociety.com ◆ www.theorsociety.com

2024 Lyn Thomas Medal winners

Bart Baesens

Applications of Machine Learning and Artificial Intelligence

Bart Baesens is a highly appropriate winner of the Lyn Thomas award, as his research was inspired by Lyn and they worked in the same field. Lyn was the external examiner of Bart's PhD in 2003 and they worked together until Lyn's untimely death in 2016. In his application, Bart states 'Thomas's influence on my research career has been profound and shapes my work up until this very day'.

Bart's research focuses on real-world applications of machine learning and AI, including financial modelling, credit risk scoring, and fraud detection. He has developed innovative methods to support managerial decisions by enhancing the interpretability of complex AI models, and also address issues of bias, fairness, and inclusivity. He has created evaluation metrics and techniques that align machine learning outcomes with business profitability. He has won the 2014 EJOR Application Paper award, the 2017 EJOR Theory and Methodology award, and the 2016 Goodeve Medal.

While Bart's methods for fraud and anomaly detection are used worldwide by finance firms and banks such as Allianz, BNP Paribas, Fortis, KBC and ING, his recent work has a more societal focus. His BlueCourses online learning initiative has led to collaborations with environmental organisations like Waste Free Oceans and WWF.

Bart is a great communicator, running a YouTube channel with 120 free video lectures and 12,800 subscribers as well as a fortnightly free newsletter sent to over 2,000 international industry contacts. He has written three books aimed at practitioners as well as students, and has delivered over 100 courses for international firms, institutions, consulting companies and regulators.

Bart has worked with commercial citrus orchards in Valencia, Spain on smart agriculture, to predict soil water potential as a key indicator for sustainable irrigation. His research on using telephone company data for credit scoring has enabled many disadvantaged people, who often struggle to secure loans due to a lack of credit history, to obtain bank loans. This approach is particularly relevant in developing countries, where historical financial data are unavailable.

His industry courses have been positively evaluated by thousands of practitioners all over the world. His research has inspired policy papers issued by regulatory authorities and institutes such as the Reserve Bank of India, the Indian Accounting Association, the Banque de France, the Banco de México, and the National Bank of Kazakhstan. His three books are not only used as academic textbooks but also serve as practical guidelines for practitioners developing and

refining their credit risk, fraud and database models. They have sold over 30,000 copies globally and have been well received by practitioners.

2022 Lyn Thomas Medal winners

Professor Navonil Mustafee, Emeritus Professor John H. Powell, Dr Alison Harper, Professor Todd R Kaplan, Professor Surajeet Chakravarty, Susan Martin and Andrew Fordyce.

A digital platform to reduce A&E peak time demand across the South West of England.

This is a joint team from University of Exeter Business School and South Devon and Torbay NHS Foundation Trust.

NHSQuicker is an app that provides live waiting time data from hospital Emergency Departments and Minor Injury Units, and estimated travel times (by various modes of transport) based on the user's location. It also provides information on alternative local health services like GPs and pharmacies. The aim is to help patients make informed decisions on where to go for urgent medical treatment in real time, using a 'nudge' type approach; for example, if people can see the waiting time in A&E is very long they may decide to go elsewhere, even if it is further away.

There are two strands of underpinning research: technical and behavioural. The researchers worked with NHS technical teams (IT systems engineers and database administrators) to develop an open data standard based on linked administrative data. Today the app receives real-time data from nine A&E departments, 18 Minor Injury Units and 12 urgent care centres across the south west of England. The behavioural research tested people's decision processes and preferences when seeking medical care, based on the level of information provided.

The app is now available to 1.7 million people, with over 40,000 people actively using it. It runs on both Android and iOS. It has led to shorter waiting times and improved patient experience, enabling patients to make more appropriate choices of where to go, and has smoothed demand on overstretched Emergency Departments. A hospital Trust director said: "NHSQuicker has impacted significantly upon the pressures faced by the A&E departments at both the Royal Devon & Exeter and the North Devon Hospital. There has been a significant shift from the start of 2018 in the pattern of attendances, with a reduction in Emergency Department attendances and an increase in Minor Injury Unit attendances. This has led to better services for the patient and led to reduction of overcrowding in the Emergency Department.'

NHSQuicker has been featured on the BBC's Spotlight programme and on ITV News South West. It was also a finalist for the 2018 Health Service Journal awards in the category "Enhancing Care by Sharing Data and Information'.

Future work will be focused on scaling up the use of the app from a regional to a national setting.

2021 Lyn Thomas Medal winners

Professor Paul Harper (OR Group, School of Mathematics, Cardiff University)
Dr Izabela Spernaes (Aneurin Bevan University Health Board (ABUHB))
Dr Daniel Gartner (OR Group, School of Mathematics, Cardiff University)
Dr Tracey England (OR Group, School of Mathematics, Cardiff University)
Dr Doris Behrens (OR Group, School of Mathematics, Cardiff University, Aneurin Bevan University Health Board (ABUHB)
Dr Vincent Knight OR Group, School of Mathematics, Cardiff University)
Dr Geraint Palmer (OR Group, School of Mathematics, Cardiff University)
Dr Mark Tuson (OR Group, School of Mathematics, Cardiff University)
Professor Sue Bale (Aneurin Bevan University Health Board (ABUHB))

Since 2014 a group of OR academics at Cardiff, led by Professor Paul Harper, has worked closely with the Aneurin Bevan University Health Board. Under a 'researchers in residence' scheme, staff, PhD students and post-docs are embedded within the hospital's Continuous Improvement Department, giving them direct access to financial planners, senior managers and clinicians. Moreover the team are seen by NHS staff as colleagues rather than outsiders, and this relationship has provided opportunities to pioneer novel modelling techniques within the NHS.

Many OR techniques have been used to approach problems such as forecasting, demand and capacity planning, simulation, optimisation, and scheduling. The team have also trained NHS staff in modelling skills. To date the modelling team has a portfolio of over 150 completed projects and their work has directly led to evidenced cost savings of at least £12.1M.

The examples listed in their application include informing the design of a new hospital, leading to ongoing savings of £900,000 a year over the original design; and supporting mental health outreach teams, leading to a reduction of 79% in avoidable hospital admissions.

They were also involved in designing and launching the NHS 111 Service and in advising the Welsh Government about the response to COVID-19, in particular initial demand and capacity planning and logistics.

It has been said for many years that the NHS lags behind other organisations in its use of OR. The Cardiff team have demonstrated how to change this. I am sure Lyn would agree that they are worthy winners of the award that bears his name.

2019 Lyn Thomas Medal winners

Sonya Crowe, University College London, Christina Pagel, University College London and Martin Utley, University College London

Paper: "Improving services for children with congenital heart disease"

CORU has had an international reputation for impactful research in health OR for over 35 years. The Unit's ground-breaking work in paediatric cardiac surgery in the 1990s led to the creation of Variable Life Adjusted Display or VLAD charts, now widely used for monitoring risk-adjusted health outcomes.

This award is made for a programme of research related to congenital heart disease. These three projects are typical of CORU's work. They all involved rigorous, innovative OR; close collaboration with clinicians; and the effective use of data visualisation and user-friendly software tools to support NHS decision-makers.

In the first project, the team developed an Excel-based tool called PRAiS for monitoring 30-day outcomes after heart surgery. This is now used by all UK hospitals and is mandated by the Care Quality Commission.
In the second, they used a combination of 'soft' and 'hard' OR methods to monitor longer-term outcomes, which informed NHS England's priorities in providing services for these children.
In the third, most recent project, they developed a tool to select and monitor complications after surgery that takes into account the views of both clinicians and parents.
This research has had significant impact on the lives of children with congenital heart disease, as well on their families and the growing population of adults with the condition, now that more children are surviving into adulthood. It is hard to imagine more worthy inaugural winners of this award, named in honour of Professor Lyn Thomas, whose own research was so hugely impactful.