

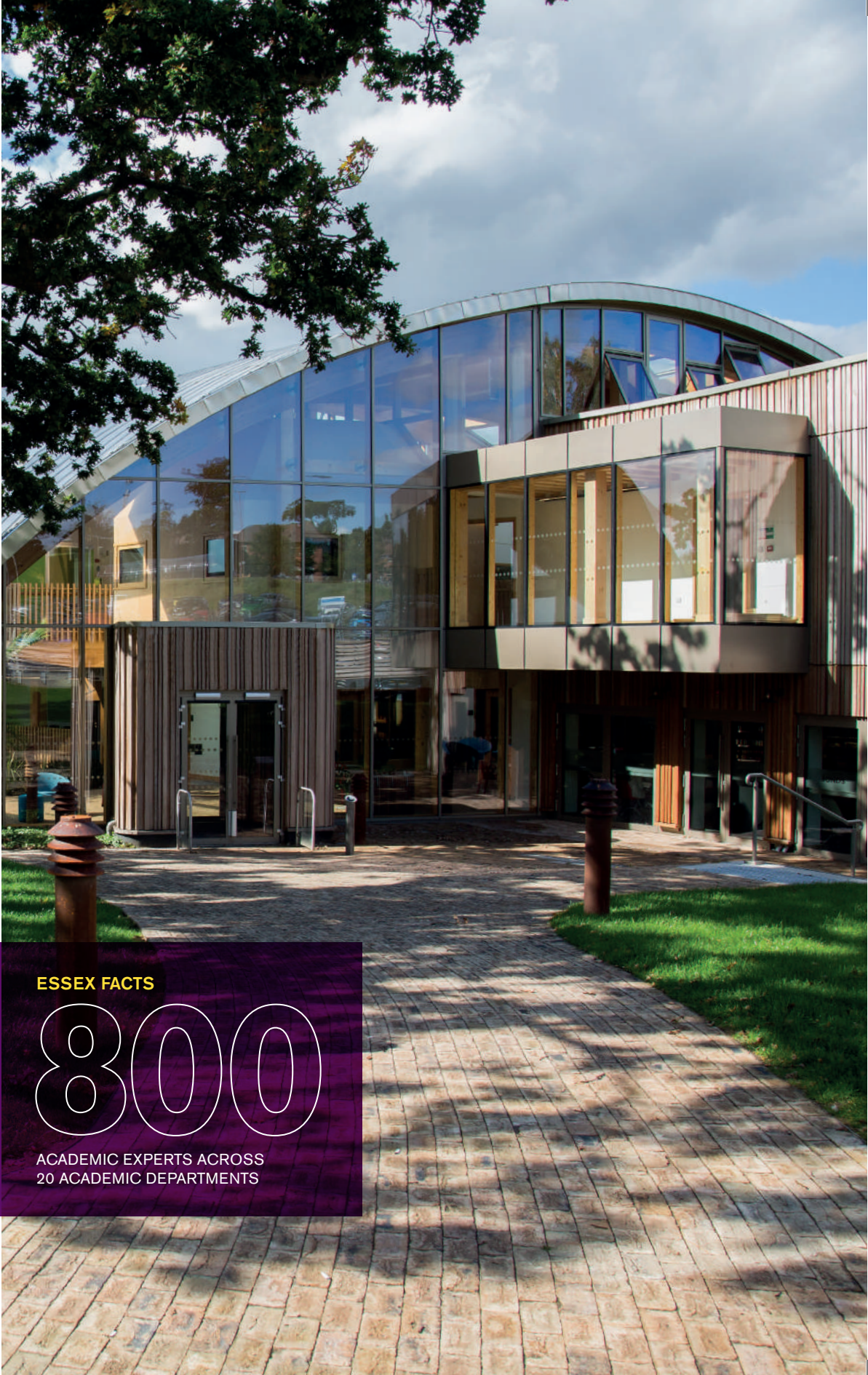


University of Essex

# **ESSEX**

**A WORLD-CLASS CENTRE  
OF EXCELLENCE IN**

# **ANALYTICS AND DATA SCIENCE**



**ESSEX FACTS**

800

ACADEMIC EXPERTS ACROSS  
20 ACADEMIC DEPARTMENTS



**“Our work spans the  
full spectrum of  
data science”**

We are at the dawn of the fourth industrial revolution – a revolution underpinned by computational technologies and massive amounts of data.

It's a revolution in how we collect, analyse and use information in every aspect of our lives. How we do business. How we deliver public and private services. And even how we relate to each other.

But it's more than this. It's a paradigm shift. And a revolution in the mind. It changes the way we look at things and how we understand the world around us.

It is a new scientific revolution. We believe that the proliferation of data is neither malign nor benign – but it is omnipresent. At Essex we are uniquely placed to respond to the challenge of the data revolution, making sure the use of 'big data' is for the benefit of society.

For over half a century, the University of Essex has been the intellectual home of the world's leading experts in analytics and data science. Our work spans the full spectrum of data science, from data storage and curation to the application of scientific knowledge to the real world.

In 2014, under the leadership of Professor Maria Fasli, the UNESCO Chair in Analytics and Data Science, we created the Institute for Analytics and Data Science.

We have created a centre of excellence that connects with scholars, businesses, institutes and authorities. We are keen to work with partners across the globe who share our commitment to using data to make the world a better place.

A handwritten signature in black ink that reads "Anthony Forster". The signature is written in a cursive, slightly stylized font.

**PROFESSOR ANTHONY FORSTER  
VICE-CHANCELLOR**

# THE ESSEX DATA ECO SYSTEM

Here's a quick overview of what the University of Essex offers

## RESEARCH INFRASTRUCTURE

Internationally-acknowledged centre of expertise in acquiring, curating and providing access to data.

- Unique repository for arts, humanities and social science research
- Curation experts – international reputation for data management guidance
- Secure Lab – first university to offer secure environment to access sensitive data
- Home to Understanding Society - one of the world's largest household panel surveys

## WORLD-CLASS RESEARCHERS AT ESSEX

### PROFESSOR MARIA FASLI

UNESCO Chair in Analytics and Data Science and Director of the Institute for Analytics and Data Science

### PROFESSOR SLAVA MIKHAYLOV

Professor of Public Policy and Data Science

### PROFESSOR MEENA KUMARI

Leading expert in biomarkers and genetics

### PROFESSOR LEO SCHALKWYK

Leading expert in human genetics

### PROFESSOR EDWARD TSANG

Leading expert in computational finance

### PROFESSOR NEIL KELLARD

Leading expert in finance



## CENTRES OF EXCELLENCE

- Business and local government data analytics
- Social and economic data research
- Administrative data – sharing knowledge, methods and insight
- Artificial intelligence
- Genomics

## STRATEGIC PARTNERSHIPS

- Major partnership with telecoms giant BT
- UK Government has invested in Essex as part of a multi-million-pound national data infrastructure
- Collaborations with Suffolk County Council and Essex County Council, one of the largest local authorities in England
- Award-winning Knowledge Transfer Partnerships improving productivity and performance and driving innovation
- Supporting multiple businesses to increase profitability

## TRAINING THE NEXT GENERATION OF GLOBAL DATA SCIENTISTS

### ESSEX SUMMER SCHOOL

Pioneering teaching of advanced statistical methods to answer key social, political and economic questions.

### BIG DATA AND ANALYTICS SUMMER SCHOOL

Expert training in big data, data science and data analysis.

### HUMAN RIGHTS SUMMER SCHOOL

Teaching methodologies for human rights research including best practice in data usage.



ESSEX FACTS

TOP  
10

FOR KNOWLEDGE  
TRANSFER PARTNERSHIPS  
IN THE UK (INNOVATE UK)



# It's not just our history that sets us apart

We have a long history of data science at the University of Essex. Since the 1960s, our pioneering researchers have helped the world make the most of the opportunities science and technology can bring.

We have a globally unique research infrastructure and our strengths lie in a range of subject experts who are willing to cross strict disciplinary boundaries, driven by our strong motivation to make the world a better place.

### A mission to change lives

We want to harness the power of data to change the world.

We build confidence in decision-making, so policy makers can identify the right choices. We work to obtain insights from data that can deliver actions with real value and tangible outcomes. We also help people create new products and services that can bring about positive results for businesses, individuals, and society.

### A unique environment

Data scientists at Essex, from a range of disciplines, work together, challenging conventional approaches and using data to solve the big problems we face in all aspects of our lives. That's what makes us different. And that's why we have such a great track record in making the world a better place.



### Our pioneers in artificial intelligence and computational methods

- Professor Raymond Turner is known around the world for his pioneering research in logics for artificial intelligence and the philosophy of computer science.
- Professor Jim Doran has been a proponent of agent-based systems and social simulation and has applied such methods to understand social phenomena in archaeology and anthropology.
- Professor Richard Bartle was named the first 'Online Game Legend' by the Games Developers Conference - the world's largest professional game industry event. He co-created the first virtual world, called MUD, in 1978 and his 'Player Types' model has had a huge impact on the massive multiplayer online (MMO) industry.

# Leading the way in new data science techniques

Essex is one of the first three UK universities to house a central research activity in artificial intelligence (AI). We've been working in AI, gamification, machine learning and understanding complex systems for five decades.

Our researchers have been field-defining. They developed complex multi-agent systems models to simulate prehistoric hunter-gatherer societies and understand the behaviour of social insects; they brought together philosophy and the rigour of computational logic to spearhead understanding of artificial intelligent systems and they created the first virtual world game.

## The next generation of smart computational methods

What is the optimal age for children to start school? What are the most effective measures to support children of given socio-economic characteristics to attain better outcomes? What is the best personalised health plan for this individual?

These are just some of the important questions we're trying to answer. The emphasis is no longer just on predictive analytics, but on prescriptive analytics. Not just what is going to happen in the future, but what we need to do to make it happen.

With unique academic strengths in artificial intelligence, Essex scientists lead the way in the next generation of computational and analytical methods to derive powerful insights from data. Our researchers work on advanced analytics and machine learning techniques to enhance our knowledge of individuals and society.

## Supporting innovators

Our award-winning Games Hub on our Knowledge Gateway research and technology park delivers a hugely successful training programme for digital creative entrepreneurs supported by leading industry professionals.

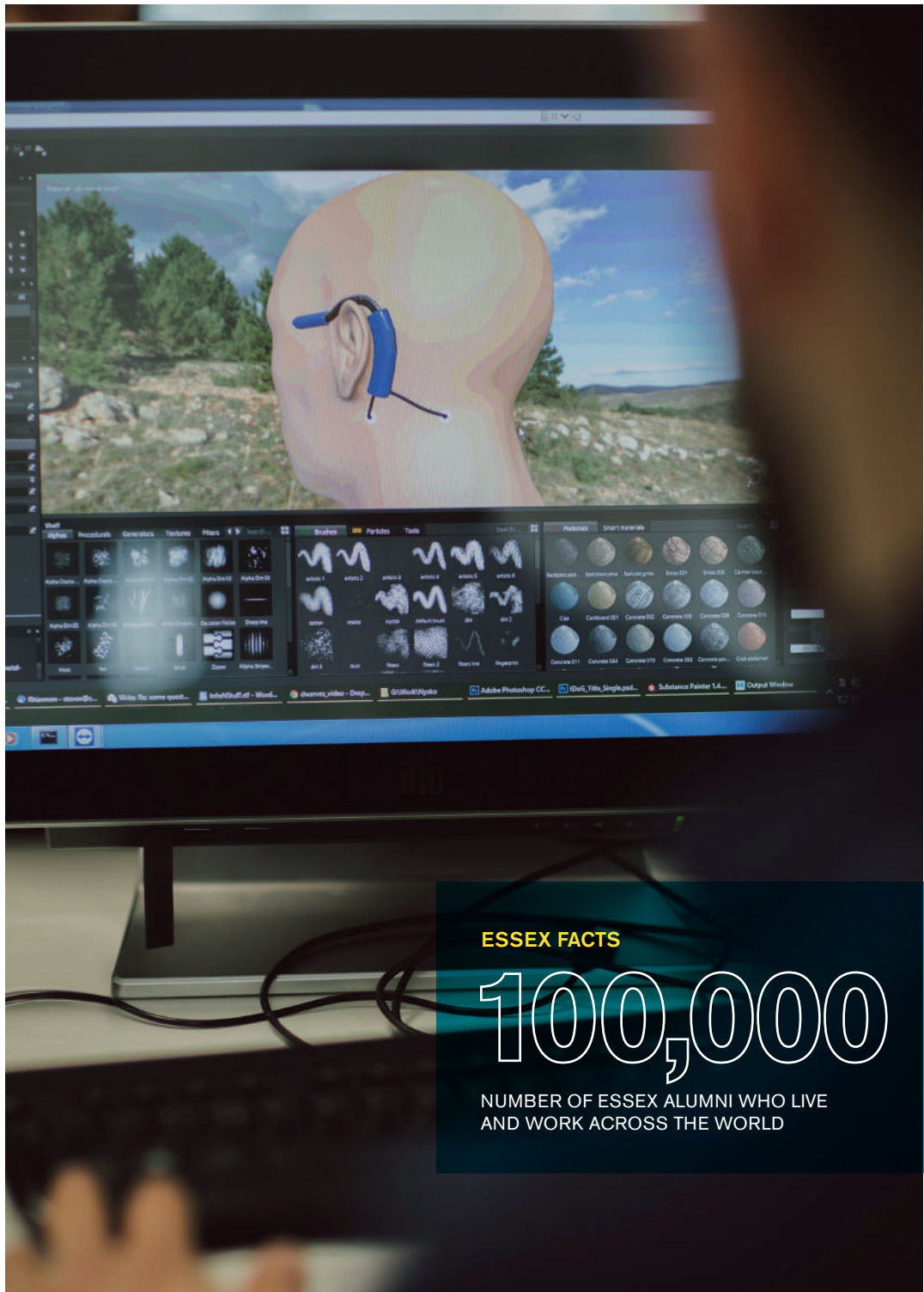
The new companies being created by the Games Hub are receiving attention from Mashable and Tech Radar for their addictive games apps.

It adjoins our Start-up Hub, fostering entrepreneurship through hot-desk space and hands-on business support for innovators including student and graduate start-ups. The Start-up Hub is now home to 14 businesses ranging from retail websites to healthcare apps using AI.

We're using the abundance of observational data available and can uncover complex and nuanced relationships on a scale never before possible. Our findings enable decisions and actions at the individual level – much better than making decisions based on averages that obscure important details.



## THE ESSEX APPROACH



### ESSEX FACTS

# 100,000

NUMBER OF ESSEX ALUMNI WHO LIVE  
AND WORK ACROSS THE WORLD

# Beyond the research – how we apply our knowledge

We're leaders in applying scientific advances to the worlds of public policy, business, health and well-being.

## Influencing public policy

We're the first university in the UK to appoint a Chief Scientific Advisor to a local government authority. Slava Mikhaylov, Professor of Public Policy and Data Science, uses data to help Essex County Council reshape public policy and service delivery.

Essex County Council is one of England's largest local authorities. As the Chief Scientific Advisor, Slava is transforming the way public services are being delivered by embedding data science into government decision making. In particular, the combined resources of the University and the public and private sectors are developing predictive analytics capability that can unlock the potential of big data for the benefit of the public.

We're also helping Essex County Council and Suffolk County Council use technology to improve services for their 2.5 million residents. We're working with them to improve services for vulnerable people – using our expertise in data analytics to assess risks and evaluate the impact of their initiatives.



## Our global development goals

Data is essential for business, public services, and policy making. However, access to data isn't enough – analytics skills are vital to make the most of the information available. The demand for data specialists is growing at an unprecedented rate. Developing countries also don't have access to the same improvements in data literacy we're used to. Thanks to our strength in big data, we are focusing on:

- **Developing research capacity in analytics and data science, and helping developing and transitioning countries create a sustainable research base**
- **Using education and outreach to improve the data literacy, capacity and skills of graduates, public service workers and professionals.**

Bridging the gap between knowledge-rich and knowledge-poor people, we are playing leading roles in ensuring people are able to understand data and hold governments, institutions and organisations to account, reduce inequality and improve lives.

## THE ESSEX APPROACH



“Data analytics is a  
real area of strength at  
Essex and we can use  
it to drive innovation”

SLAVA MIKHAYLOV, PROFESSOR  
OF PUBLIC POLICY AND DATA SCIENCE

# GETTING UNDER THE SKIN WITH BIOMARKERS

We know that the world around us can affect our health. Where we live, how we grow up, how stressful our lives are – lots of factors can have an impact. However, it's less obvious how these external factors can change our biology to affect our health. Conversely, genes that are inherited from our parents can influence our health and lives, and in turn the environments in which we live can alter the way in which our genes operate. To understand the two-way relationship between our circumstances and our health, we need to understand the biological pathways that link them.

## Breakthrough scientific research

As we lead the world-renowned UK household panel study Understanding Society we added a nurse interview to measure objective indicators of our biological processes, known as biomarkers. The indicators included everything from height and blood pressure to genomics.

The biomarkers we measure can tell us a lot about a person's susceptibility to illness. For example, HbA1c tells us how people process sugars and can help us diagnose the risk of diabetes.

## Understanding biological pathways to improve health

By gathering the data, we can better understand the causes of health problems. This means we design policies to address them.

Because the biomarkers are measured as part of the larger Understanding Society project, we get a complete picture of the individual. We can see how social and working environments can influence health, and how our genes can influence the extent to which we're affected by those environments.



*"Biomarkers can tell us about people having an illness or being at high risk of one before they experience any symptoms. They also help us understand how people's social circumstances change their biology in ways that affect their health."*

PROFESSOR MEENA KUMARI, A LEADING EXPERT IN BIOMARKERS AND GENETICS

This two-way understanding of genes and environment can help us identify people at risk of different hazards. Our findings are paving the way for new genomics work in social science and could help governments make wide improvements to people's health around the world.

## DATA CASE STUDY

### Using genomics to answer big questions

Essex researchers are analysing socio-economic characteristics, behaviours and biomarkers. We're working to answer fundamental questions about nurture and nature and to understand how different factors influence life chances.

*"We're breaking new ground in bio-informatics. Developing tools to analyse large genomic datasets and integrating genomic and phenotypic data."*

PROFESSOR LEO SHALKWYK LEADS OUR  
GENOMICS RESEARCH GROUP



# Putting people at the heart of data science

The cornerstone of our approach to data science is that data is all about people. We're pioneers of this attitude at Essex and our projects all aim to have a tangible benefit for society.

Our world-leading Institute for Social and Economic Research (ISER) is home to three ground-breaking research projects: Understanding Society, the Research Centre on Micro-Social Change and EUROMOD.

## Understanding Society

For 27 years, our researchers have collected data on the social and economic circumstances, attitudes, behaviours and health of 100,000 individuals in 40,000 households. The project, led by Professor Michaela Benzeval, is one of the world's largest household panel surveys, providing valuable evidence about twenty-first century life in the UK. ISER's team of research and survey experts specialise in the production and analysis of longitudinal data and provides evidence on how people's lives are changing over time.

From 2016, we started collecting biomarkers, as well as socio-economic data. This allows us, and researchers around the world, to analyse the way inherited genes and lifestyle choice determine life chances. We lead the way in nurture-nature debates thanks to our genetic and epigenetic analysis of biological samples and DNA, and the minority ethnic and immigrant boost sample added in 2015.



## Research Centre on Micro-Social Change (MiSoC)

This multidisciplinary centre examines how behaviours, outcomes and attitudes for individuals, households and families are influenced by, and themselves influence, the wider processes of macro-social change.

## EUROMOD

EUROMOD is a powerful tax-benefit micro-simulation model which allows researchers and policy analysts to work out how taxes and benefits affect household income and work incentives for any country in the EU. It is updated annually in collaboration with national experts from each EU member state.

The results are used to inform policy, from stress-testing a tax-benefit system to designing and testing the effect of different incentives for citizens under different conditions. New models are being created for developing countries across the globe.

ESSEX FACTS

100,000

THE NUMBER OF PEOPLE INVOLVED  
IN UK HOUSEHOLD PANEL STUDY  
UNDERSTANDING SOCIETY







# REPORTING WARTIME RIGHTS ABUSES

The Iraq War prolonged civil unrest and the emergence of ISIS in the region has created a humanitarian crisis. Life for ordinary Iraqis is difficult, and often deadly. Now the power is shifting. Thanks to our scientists, the people of Iraq have a tool to report rights abuses.

## Harnessing the power of social media

In Iraq, as in other regions affected by conflict, people are using social media to record what happens. Photos, videos, and status updates are being used to document human rights abuses.

Despite this, crimes like torture, killings and sexual violence have not been formally reported. The new online tool makes civilian-led monitoring of crimes real and helps the international community respond.

Scientists from Essex's Language and Computation Group worked with Minority Rights Group International and the Ceasefire Centre for Civilian Rights to develop the tool.

This project has been funded by the Engineering and Physical Sciences Research Council (EPSRC) and Innovate UK.

## What does the tool do?

The online reporting tool uses crowd-sourcing technology, including live mapping and social media data mining, to provide a secure and anonymous platform for real-time reporting of violations in a format compatible with international legal standards.



*"Iraqi civilians are on the frontline of a war and a protracted humanitarian crisis but this project empowers them to go beyond the role of victims. Today their voices are heard."*

MARK LATTIMER, EXECUTIVE DIRECTOR,  
MINORITY RIGHTS GROUP INTERNATIONAL

Data submitted through the secure tool (in Arabic or English) is used to create a more accurate and up-to-date picture of the situation in Iraq which crucially can be verified.

## Applying the tool beyond Iraq

Today the tool is helping to motivate a more effective national and international response, and strengthen calls for accountability in Iraq.

Tomorrow it could be applied around the world, allowing civilians to take control and produce much-needed data about violations in other armed conflicts where traditional fact-finding missions do not work.



ESSEX FACTS

TOP

20

IN THE UK FOR RESEARCH  
EXCELLENCE (REF 2014)

# Pioneering secure and ethical access to data

We not only develop powerful new techniques and methods to extract insight from data, we're also advocates for using data ethically.

We drive archival innovation. Our unique data infrastructure is designed to offer secure access to unique data assets.

## Secure data services

Since 1967 Essex has been the home of the UK Data Archive – the sole repository for all arts, humanities and social science research funded by a UK research council.

Essex is the location of choice for higher education access to UK government datasets. ISO 27001 certification allows us to securely store and manage access to confidential and sensitive data sets.

We also host the UK Data Service's SecureLab, where researchers can access sensitive personal government data in a secure environment.

As the first university in the country to provide this service, we now advise governments around the world in how to develop secure data access facilities.

## Shaping current thinking

Our data curation experts are internationally recognised. Professor Matthew Woollard and his team have become the go-to experts for help on data management



issues. We lead the way in good practice on ethical uses of data and data sharing protocols which place data owners and controllers at the centre.

Our scientists also developed the UK Economic and Social Research Council's Research Data Policy, and we've given advice to a huge range of government organisations. Thanks to our expertise, valuable social and economic data is secure and accessible.

# IMAGINE BEING ABLE TO PREDICT A CRIME IN THE FUTURE

Advanced computer software, designed to enable police to predict both the perpetrator and the timing of a crime, saved the Milan Police Department close to 2.5 million Euros in one year. Professor Giovanni Mastrobuoni from our Department of Economics undertook the programme's first academic evaluation.

## How does it work?

Robbers are creatures of habit and criminal gangs tend to select the same business types, around the same time of day and in the same city or neighbourhood – especially if previous robberies have been lucrative.

“When these habits are properly tracked and identified, that predictability can be put to effective use,” said Professor Mastrobuoni.



*“When this advanced yet inexpensive IT innovation is used, differences in police productivity are striking.”*

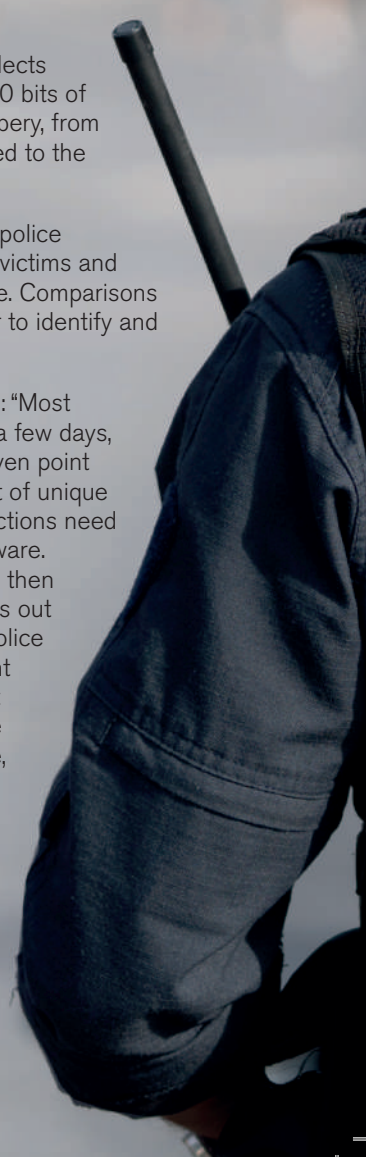
PROFESSOR GIOVANNI MASTROBUONI

The KeyCrime software collects and analyses around 11,000 bits of information about each robbery, from the type of weapons involved to the criminal's eye colour.

This is then combined with police reports, interviews with the victims and surveillance camera footage. Comparisons then establish links in order to identify and predict criminal strategies.

Professor Mastrobuoni said: “Most re-offending occurs within a few days, which means that at any given point in time there is a limited set of unique groups of robbers whose actions need to be predicted by the software. When all of this information then becomes available to patrols out on the streets, it puts the police in the right place at the right time. There is no doubt that this type of micro predictive policing is a highly effective, efficient IT investment.”

Professor Mastrobuoni is currently working with Essex Police in developing and evaluating effective predictive policing practices.



A photograph of two Italian police officers in uniform. The officer in the foreground is seen from the back, wearing a dark blue beret and a tactical vest with the word "POLIZIA" printed in large white letters. The officer in the background is wearing sunglasses and a similar uniform. The background is blurred, showing a crowd of people.

**POLIZIA**

ESSEX FACTS

22<sup>ND</sup>

SUNDAY TIMES AND  
TIMES GOOD UNIVERSITY  
GUIDE 2018



# Using data to solve real-world issues

Professor Maria Fasli, UNESCO Chair in Analytics and Data Science, explains why Essex takes such a unique perspective on the world of data.

The data revolution is shaping every aspect of our lives and we are at the precipice of fundamental change.

The cornerstone of our approach in data science and analytics at Essex is that data is all about people.

It's not just the science that matters – it's the social impact that has real meaning. Essex researchers want to have a positive impact on the world and that gives our work real value and a unique sense of purpose.

The challenges the data revolution poses can only be addressed through a concerted effort that requires new interdisciplinary approaches to data science, questioning conventional approaches and breaking away from strict disciplinary norms.

For me, as Director of our Institute for Analytics and Data Science (IADS), the exciting thing is working with people from very different perspectives. Together they ►



◀ can challenge me and drive my thinking in new directions to generate novel solutions. We need to break down silos to solve real problems. That's a real strength of Essex. We want to harness the power of data and computational technologies for the benefit of all.

New analytics and machine learning techniques are needed which can make use of the abundance of both structured and unstructured data around us - such techniques could uncover nuanced relationships on a level and scale never before possible.

### **Maria's unique perspective on data challenge**

Professor Maria Fasli has a background in artificial intelligence, machine learning and modelling complex systems.

Her theoretical grounding, transdisciplinary exposure and extensive experience in applying methods and techniques in real-world problems, have given her a unique perspective in analytics and data science.

Her work covers fundamental theory projects in understanding the evolution of institutions and societies co-inhabited by humans and artificial

intelligent systems. She also works on more application-oriented projects in developing and applying modelling and machine learning techniques in domains such as marketing and insurance and providing medically-approved health advice to patients. Her research has been published extensively in scientific journals and has been funded by UK research councils, Innovate UK and businesses. She has a genuine passion for education and her commitment to providing students with a transformative experience has been exemplified throughout her academic career.



## IMPROVING THE WORLD



We need more elaborate and efficient predictive analytics, but also to push the boundaries in prescriptive analytics – new powerful analytics and machine learning methods can lead to informed decisions at the individual level rather than make decisions based on averages.

By collaborating with other members of the global UNESCO Chairs network, I am helping deliver UNESCO's ambitious Sustainable Development Goals which include helping transitioning and developing countries to gain the data science and analytics skills they need for the twenty-first century. My UNESCO role is addressing the acute data science skills shortage in developing and transitioning countries and to ensure the benefits of the data revolution reach all walks of society.

Working with collaborators and experts from around the world, seeking to improve the use of data, will have the knock-on effect of developing strong and self-reliant knowledge economies, which in turn will mean better services to improve the lives of citizens.

It's an exciting and ambitious global project that I am delighted Essex is playing a part in.



*"The international development community are exploring how big data and the data revolution can be harnessed for sustainable development through facilitating data-driven, evidence-based decision-making, accountability and results monitoring."*

*"Professor Fasli's critical work in this space is working to strengthen the contribution of data to sustainable development at both the micro and macro level through data literacy programmes and state-level capacity building."*

PROFESSOR KIRAN FERNANDES,  
DIRECTOR, UK NATIONAL COMMISSION  
FOR UNESCO'S HIGHER EDUCATION



# WHEN THE FINANCIAL BUBBLE BURSTS

**Global financial markets are locked in a cycle of price bubbles and crashes, causing enormous damage to economies and communities around the world. At Essex we are a major driving force in computational finance.**

We have taken a leading position in exploring the synergy between computation and finance. We take a multidisciplinary view in the world of finance. By looking at the impact on financial markets from different angles we offer a more comprehensive view on how to predict and ease the impact of these market changes.



*“At Essex, we have undertaken research into improving the forecasting of a range of linked asset prices including stock, energy and food prices. For example, improved ‘early-warning systems’ for very high food prices can help developing country policymakers design quick and effective responses to support diets, bring down prices and lessen the tragic increase in infant mortality which can occur when communities are vulnerable and income is low.”*

PROFESSOR NEIL KELLARD, ESSEX BUSINESS SCHOOL



*“Financial crises do not just hurt investors, they hurt everyone in society.”*

PROFESSOR EDWARD TSANG, CENTRE FOR COMPUTATIONAL FINANCE AND ECONOMIC AGENTS

## Forecasting financial crashes

Our goal is to monitor markets so central banks can raise the alarm or intervene when problems are detected. If we succeed, we could help governments and financial regulators reduce the number of damaging booms and busts.

Recent work by Essex researchers to detect market bubbles and forecast the following crash is showing real promise. The more accurately we can predict prices, the more time authorities have to intervene to smooth fluctuations and limit their negative consequences.



ESSEX FACTS

15<sup>TH</sup>

MOST INTERNATIONAL  
UNIVERSITY IN THE  
WORLD (THE 2017)

# We believe in a future where data benefits all of humanity

We're working towards a society where anyone can use data for social good.

Data permeates every aspect of our lives. At Essex, we believe an interdisciplinary approach is the only way to harness its full power and deliver meaningful insights that will make a real difference to the world.

We aim to shrink the digital divide and empower others. We're teaching people the skills to understand data and to use it in new ways to improve lives.

## Looking ahead

The Institute for Analytics and Data Science is young, but ambitious. We are focused on delivering high impact research and our commitment to taking an interdisciplinary approach lies at the heart of this.

We are developing new lines of interdisciplinary and multidisciplinary foundational research. We are applying our research to even more real world uses, working with governments, NGOs, and businesses.

As well as developing our own work, we are providing more opportunities for graduates and professionals to learn data science skills. Under the leadership of the UNESCO Chair in Analytics and Data Science, we are collaborating on research development, training programmes, and knowledge exchange with partners from across the world.



**“We aim to shrink the digital divide and empower others”**



# BIG DATA, BIG THREAT?

Digital technology and the big data it generates about every aspect of our lives, offers unique opportunities. However, the 2013 Edward Snowden revelations revealed it also comes with great risks. How is our big data stored and accessed, and by who? What are the implications for our privacy, security and democracy. How can big data be used to identify human rights abuses, develop policies and to target humanitarian aid?

Essex researchers are finding answers to difficult questions in a major study funded by the Economic and Social Research Council and the University.

## Living in a digital world

Corporations and states have the power to access information about our political affiliations, sexual orientation, shopping and travel habits, even health status.

This data can be used to make our lives easier and safer, but it can also be used to discriminate, stifle protest and undermine our rights.

In 2016 we launched our Human Rights, Big Data and Technology Project. 30 Essex researchers, with colleagues at the University of Cambridge, are exploring how to secure human rights in this digital age.

They are investigating a wide range of issues, from predictive policing to counter-terrorism, and from insurance premium algorithms to human rights abuses identified through social media.

## A multidisciplinary approach

Our multidisciplinary Human Rights Centre is the ideal institution to direct the study. One of the oldest academic



*"The goal of this project is to make sure the technology has more net benefits for human rights work rather than for repressive governments."*

AMBASSADOR EILEEN DONAHOE,  
FORMER DIRECTOR OF GLOBAL AFFAIRS,  
HUMAN RIGHTS WATCH

human rights centres in the world, our lawyers, sociologists, computer scientists, economists, criminologists, human rights practitioners and data experts are just some of the researchers working together on this project.

Our links to key UN agencies, human rights organisations, NGOs and technology companies are crucial to realising significant impact.

# The next generation of data scientists

Essex has a long history of passing on our ground-breaking research methods by training the next generation of scientists. We're committed to excellence in research and excellence in education. For us, the two are inextricably linked.

## Essex Summer Schools: Data science programmes at every level

Data science transcends disciplines and data scientists contribute to a diverse range of sectors. We ensure our education and training programmes reflect this. From undergraduate to PhD, our programmes aim to address the global skills shortage.

Since 1967 the world-renowned Essex Summer School in Social Science Data Analysis has brought global-leading teachers and researchers from over 36 different countries to Essex to teach students cutting-edge tools for social science data analysis.

Our Big Data and Analytics Summer School brings together practitioners from leading global technology companies and academics to educate and train graduates, students, researchers and professionals in big data, data science and data analytics.

In 2015, our Human Rights Centre - one of the oldest academic human rights centres in the world - launched its Summer School on Human Rights Research Methods. Students receive gold standard training in methodologies for human rights research and practice, including an emphasis on

## Training

Our expertise attracts major funding from UK research councils to deliver ground-breaking doctoral training programmes in a range of areas including:

- **Exploring the most challenging social science issues of the 21st century**
- **Investigating the interplay between a person's biology, experiences and behaviour**
- **Artificial intelligence, machine learning, bioinformatics and genomic analysis of big data**

data, evidence and methods for assessing and enhancing the impact of human rights.

Our Summer Schools attract speakers and delegates from around the world, including lawyers, academics, postgraduate students, and professionals working in NGOs, government and international organisations.



## THE FUTURE IN FOCUS



ESSEX FACTS

16,000

NUMBER OF ESSEX SUMMER SCHOOL  
ATTENDEES SINCE 1967



# THE TRANSFORMATIVE POWER OF COLLABORATION

We help businesses drive innovation, productivity and competitiveness and we provide new insights into their customers to help companies deliver even better experiences. Our pioneering data analytics and data science experts make working with Essex an easy decision.

### Tracking world news with Signal

Our researchers have joined forces with Signal Media in an award-winning project to develop cutting-edge, scalable natural language processing applications that monitor and analyse the world's news. Any business will be able to use the innovative intelligence platform to follow industry news, monitor risk and opportunity, and track competitors.

### Meeting customer needs with Profusion

Statisticians and computer scientists from Essex have joined forces with data science consultancy Profusion to help businesses gain a better understanding of their customers. The special Knowledge Transfer Partnership project uses statistical methods and data analytics to develop an enhanced understanding of customer behaviour.

### Using artificial intelligence to transform healthcare with Orbital Media

Technology is revolutionising the way patients are treated. A partnership with digital and social specialists Orbital Media could save the UK's National Health Service millions of pounds per year by creating automated online GPs. The technology will be used to serve interactive advice via ground-breaking, photo realistic avatars. Information supplied by the platform will focus on minor complaints such as colds, coughs, flu and hay fever.



*"I am honoured to become the BT Industrial Visiting Professor in the School of Computer Science and Electronic Engineering at the University of Essex. BT has a strong commitment to research partnerships and to supporting the East of England region. This role further strengthens our long-standing links with the University of Essex."*

PROFESSOR TIM WHITLEY, BT'S MANAGING DIRECTOR OF RESEARCH AND INNOVATION

### Smart personnel deployment with BT

Technology is completely transforming the way BT deploys engineers – benefitting both customers and the planet. The iPatch, developed by computer scientists at Essex, enables the telecom company to plan the movement of staff. Now they can guarantee the right person is in the right place at the right time. The company has increased productivity and customer satisfaction, while reducing costs and their carbon footprint.

# Join us on our journey

Technologies have always shaped our economic, social and cultural environments. Now the speed of change and impact is rapidly increasing.

Fuelled by advances in computational technologies, the digital, physical and biological worlds are converging. We have to rethink our understanding of the world, and even what it means to be human.

For decades, the University of Essex has pioneered quantitative research methods and artificial intelligence techniques. We're ready to take on the challenges that the data revolution brings.


We hope you can join us on our journey. We'd love to hear from you if you're interested in partnering with us, funding us, or even if you'd just like to learn more about our work.

## How to get in touch

If you'd like more information about anything you've read, please email the Institute for Analytics and Data Science at: [iads@essex.ac.uk](mailto:iads@essex.ac.uk)



University of Essex

A satellite-style map of Europe and the Mediterranean region. A white line with a dot at the end points from the University of Essex logo box to a smaller white box containing the word 'LONDON'. The map shows green landmasses, blue oceans, and a bright sun on the right horizon.

LONDON