University of Birmingham

Our research in action

Explore our research case studies and navigate to School research centres using the links below.

Arts and Law

Underpinning change and influencing policy in international refugee law and guidance
(schools/law/research/influencing-policy-international-refugee-law.aspx)

Enhancing regional identity and public awareness of cultural heritage through Medieval manuscript research
(schools/edacs/departments/english/research/projects/vernon/vernon-manuscript-case-study.aspx)

Promoting public engagement with the legacy of Francoism
(schools/lcahm/departments/hispanic/research/jato-case-study.aspx)

Challenging the ethics of genetic data storage
(schools/ptr/departments/philosophy/research/projects/ethics-data-storage.aspx)

Engineering and Physical Sciences

Research Themes:

Advanced manufacturing: Engines for the Future.
(university/colleges/eps/research/advanced-manufacturing/future-engines.aspx)

Engines of today are both powerful and efficient, but the engines of tomorrow need not only to be powerful and efficient but significantly greener.

Resilience energy and sustainability: Energy at Birmingham.
(university/colleges/eps/research/resilience-energy/energy.aspx)

The way we supply and use energy is simply not sustainable. Unless we harness new methods to satisfy our increasing reliance on power sources, the impact on the environment will escalate.

Science frontiers: Particle Physics and Nuclear Physics.
(university/colleges/eps/research/science-frontiers/particle-nuclear.aspx)

The discovery of the Higgs boson was one of the biggest discoveries in physics in half a century. Our pioneering research helped to track it down.

Spotlight on our research:

Using waste matter to make important nanostructured carbon
(university/colleges/eps/news/college/2015/02/Using-waste-matter-to-make-important-nanostructured-carbon.aspx)

Biomass, particularly agricultural, industrial and food waste, is an attractive resource as it is often of zero or even negative value to the producer. For a materials chemist, it is a treasure trove of complex biological chemicals such as cellulose and lignin. In our research, we discover ways to convert these biological materials into materials for a wide range of potential applications, such as water treatment or batteries.

05/02/2015

Mapping biological sequences or tracking tweets: computer scientists find new, unique approaches to data analysis
(university/colleges/eps/news/college/2015/02/Mapping-biological-sequences-or-tracking-tweets-computer-scientists-find-new-unique-...
Classification models are of overall importance in a variety of data analysis tasks, like classifying patient data to diseases or images to categories. If the training data for these models are vectorial and expected to be fully labeled, effective classifiers are readily available. In the modern world where data are generated much quicker than we are able to analyze it, the labeling of data becomes very costly and is often partially missing.


One of the most basic concepts in Mathematics is the notion of a sum. That is, a set of three numbers such that two of the numbers add up to the third. For example, 4, 5 and 9 form the sum 4+5=9 whilst 3, 4 and 9 certainly do not form a sum! This concept is one that every school child has seen, yet there still remain many deep and difficult problems in this area.

13/11/2014

Changing Interactions: A perspective on the nature of our interaction with computers, and what this means for the future (/university/colleges/eps/news/college/2015/01/Changing-Interactions.aspx)

Professor Russell Beale delivered his inaugural lecture in November 2014. This profile celebrates his success in the field of Computer Science.

16/01/2015

Life and Environmental Sciences

Agrobiodiversity Conservation for Food Security (/http://www.birmingham.ac.uk/schools/biosciences/research/showcase/agrobiodiversity-conservation-for-food-security.aspx)

Work on genetic conservation of crop wild relatives and traditional farmer-bred crop varieties is providing a template for conservation of agrobiodiversity.

Testing a low cost solution to nuclear waste disposal in Fukushima, Japan. (/http://www.birmingham.ac.uk/schools/biosciences/research/showcase/nuclear-waste-disposal-low-cost-solution.aspx)

Researchers have been working into the development of a low cost solution for nuclear waste clean-up that innovatively employs the use of microbially-generated bio materials.

Take the Stairs: Stair climbing to increase Lifestyle Physical Activity (/http://www.birmingham.ac.uk/schools/sport-exercise/research/showcase/stair-climbing-to-increase-lifestyle-physical-activity.aspx)

Testing methods to encourage increased use of stairs, rather than escalators and lifts, to increase calories burned during daily life.

Developing a 'Tricorder' to improve Food Safety (/http://www.birmingham.ac.uk/schools/biosciences/research/showcase/developing-a-tricorder-to-improve-food-safety.aspx)

Leading the emerging field of synthetic biological research to bring the Star Trek inspired 'tricorder' a step closer to reality with focus on food safety.

Translating research - Geography, Earth and Environmental Sciences (/http://www.birmingham.ac.uk/schools/gees/research/translating-research.aspx)

From identifying the risks of a flame retardant chemical to keeping transport systems running in winter. Translating research in the School of Geography, Earth and Environmental Sciences

Translating research - School of Psychology (/http://www.birmingham.ac.uk/schools/psychology/research/translating-research.aspx)

From helping families of people with drug and alcohol addiction to the classification of Sex Offenders. Translating research in the School of Psychology.
Medical and Dental Sciences

**Screening heart disease in newborn babies**
(Research/Activity/MDS/Impact/ICS-Heart-Disease.aspx)
(Schools/Edacs/Departments/English/Research/Projects/Vernon/Vernon-Manuscript-Case-Study.aspx)
Critical congenital heart defects occur in around 2 in 1000 babies, and are a leading cause of infant death.

**Improving diagnosis and critical care for rare inherited diabetes syndromes**
(Research/Activity/MDS/Impact/ICS-Inherited-Diabetes.aspx)
(Schools/Lcahm/Departments/Hispanic/Research/Jato-Case-Study.aspx)
There are over 6,000 “rare” diseases. Collectively they account for disease in 5-10% of the UK population.

**Changing policy to prevent antibiotic resistance**
(Research/Activity/MDS/Impact/ICS-Biocides.aspx)
Antibiotic resistance is one of the greatest challenges to human health in the 21st century, with global reliance on antibiotics threatened by the emergence of new resistant strains.

**Reducing delays for patients with a new onset of rheumatoid arthritis**
(Research/Activity/MDS/Impact/ICS-Arthritis.aspx)
(Schools/Ptr/Departments/Philosophy/Research/Projects/Ethics-Data-Storage.aspx)
Rheumatoid arthritis is a common destructive joint disease, causing pain and swelling, affecting 1 in 100 people.

**Tackling heart rhythm abnormality management and therapy through primary care**
(Research/Activity/MDS/Impact/ICS-Atrial-Fib.aspx)
(Schools/Ptr/Departments/Philosophy/Research/Projects/Ethics-Data-Storage.aspx)
Atrial fibrillation is the commonest heart rhythm abnormality, raising risk of stroke and death, affecting around 8.8 million people in the EU.

**Development of predictive technologies for periodontal disease**
(Research/Activity/MDS/Impact/ICS-Periodontal.aspx)
(Schools/Ptr/Departments/Philosophy/Research/Projects/Ethics-Data-Storage.aspx)
Inflammatory periodontitis is a complex disease affecting 50% of adults globally. It costs the UK economy £2.8 billion and has health impacts beyond just dental issues.

Find out more about Medical and Dental Sciences research
(Research/activity/mds/index.aspx)

Social Sciences

(Research/activity/mds/impact/ics-heart-disease.aspx)

**Delivering Enhanced Educational Practice in Autism**
(Schools/Education/Research/Delivering-Enhanced-Educational-Practice-in-Autism.aspx)
The research underpinning the development of the Inclusion Development Programmes, the National Autism Standards, the Professional Competency Framework and the three levels of training was undertaken by academic staff at the Autism Centre for Education and Research (ACER), University of Birmingham, between 2008 and 2011.

**Removing Barriers to Learning for Visually Impaired Children and Adults**
(Schools/Education/Research/Removing-Barriers-to-Learning-for-Visually-Impaired-Children-and-Adults.aspx)
The Visual Impairment Centre for Teaching and Research (VICTAR) at the University of Birmingham has a distinguished history of research into learning and the broader use of braille by children and adults into visually impaired pupils’ access to the curriculum.

**Assisting the Conflict Settlement Process in Moldova**
(Schools/Government-Society/Research/Projects/Case-Studies/2014/Assisting-the-Conflict-Settlement-Process-in-Moldova-Test.aspx)
Professor Wolff’s research on conflict settlement processes, especially concerning ethno-territorial conflicts and the role of external parties, stretches back over a decade and has been undertaken principally by himself, and in two instances in collaboration with colleagues from the US and UK.

**Improving the outcomes of post-conflict peace-building and security reforms: Sierra Leone and Nepal**
(Schools/Government-Society/Research/Projects/Case-Studies/2014/Security-Reforms-Sierra-Leone-Nepal.aspx)
Paul Jackson’s research on post-conflict state-building has shaped processes of international intervention and internal reconciliation during and following conflicts in Africa and South Asia. His work has had impact in two main areas.
KLEMS is the acronym for EU level analysis of capital (K), labour (L), energy (E), materials (M) and services (S) inputs, and the EU KLEMS consortium was set up in 2001. The main insights from this research programme were that in order to understand why countries’ growth rates differ, it is necessary to construct data series that have a certain set of characteristics.