UNIVERSITY OF BIRMINGHAM

RESEARCH THAT MATTERS

SECURITY

The University of Birmingham is forging a reputation for being at the leading edge of the debate around global security and cyber security. From nuclear weapons to mass surveillance, our researchers at the University are developing original approaches to tackle some of the prevalent issues of the 21st century.

Key messages

- The University of Birmingham is exploring new ways of addressing the major contemporary global security challenges such as nuclear weapons and climate change, how to build trust within and between states, and how to strike a balance between security and surveillance.
- We combine a series of strengths in the field of international relations and its related subfields of security studies and strategic studies, as well as war studies, development, law, and ethics, to develop innovative solutions to address some of the biggest issues facing society.
- University of Birmingham computer scientists are designing secure cyber systems for the future, as well as researching existing cyber security systems to address their limitations.

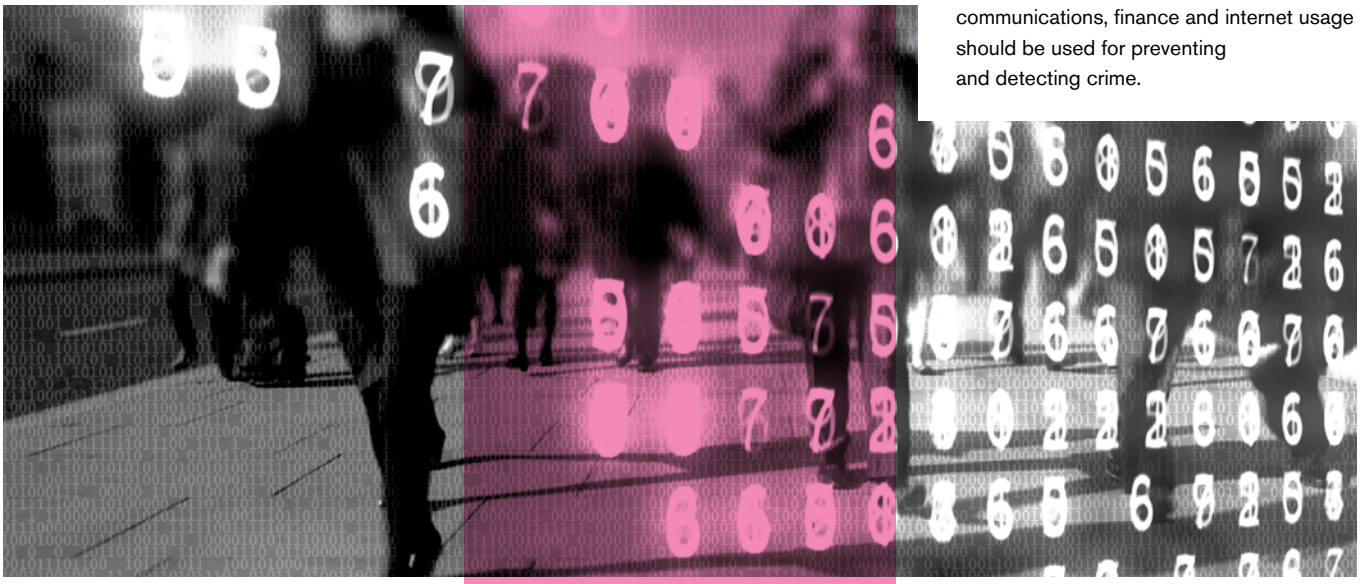
Reaper Drone

THE UNIVERSITY OF BIRMINGHAM ACADEMIC CENTRE OF EXCELLENCE IN CYBER SECURITY RESEARCH IS DEVISING METHODS TO ENSURE SECURITY AND PRIVACY SYSTEMS ARE FUNCTIONAL, EFFICIENT AND PRACTICAL FOR GOVERNMENT, INDUSTRY AND THE INDIVIDUAL.

Background

THERE IS NO BIGGER QUESTION THAN THAT OF HOW HUMANITY CAN LEARN TO BETTER CO-OPERATE IN ORDER TO MANAGE GLOBAL SECURITY CHALLENGES, AS WELL AS THE CHALLENGE OF OVERCOMING INTRACTABLE CONFLICTS AT BOTH THE INTERSTATE AND INTRASTATE LEVEL.

- The tension between individual privacy and societal security will increase as technology continues to permeate all aspects of human life. In the future, brain–computer interfaces will mean that every thought and action will be recorded by computer, with serious implications for personal privacy.
- More information is being created and therefore there is an ever-increasing set of opportunities for it to be used and abused. Society needs to agree a set of principles that govern when and how data about communications, finance and internet usage should be used for preventing and detecting crime.



SECURITY

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The evidence

- The Institute for Conflict, Cooperation and Security (ICCS), led by Professor Nicholas Wheeler, was established at the University of Birmingham in 2012 to promote a multidisciplinary approach to the security challenges arising from global interconnectedness. These challenges pose theoretical and practical questions about reducing the risk of violent conflict, as well as developing co-operation and trust, both regionally and globally.
- Since its foundation, the ICCS has been producing leading-edge, internationally renowned research that has had a significant impact on key practitioner communities. In particular, it looks at the role of trust and trustworthiness in international relations, with a specific focus on face-to-face meetings between world leaders engaging with nuclear diplomacy.
- Recognised by the government as a centre of academic excellence for cyber security, the University of Birmingham Security and Privacy Group are developing leading-edge research in the design of secure systems, automotive security, the security of embedded systems, cloud computing security, privacy technologies for individuals, network security and malware, and the analysis and verification of systems.

INTELLIGENCE AGENCIES NEED SURVEILLANCE TO PROTECT CITIZENS BUT AT THE SAME TIME CITIZENS NEED PRIVACY.

Key projects

THE SECURITY IMPACT OF DRONES

Academics from the ICCS teamed up with leading figures from the worlds of intelligence, the armed forces, international law and aerospace to produce a comprehensive Policy Commission report on the UK Government's current and future use of drone technology. The Commission, chaired by former GCHQ head, Sir David Omand, explored the military and civilian uses of drones, tackled the moral challenges facing the UK, and offered a number of strategy and policy recommendations for the coming decades. The ICCS continues to address the increasing autonomy of unmanned systems, together with aspects of civil regulation and legislation

The ICCS is also carrying out vital multidisciplinary research in diplomacy and statecraft, international conflict mediation, global nuclear governance and pioneering research in social neuroscience and security.

CYBER SECURITY

The Security and Privacy Group at the University of Birmingham's School of Computer Science is devising methods to make governments and other agencies more accountable for the personal data they collect. Currently, the US, UK and other western governments are collecting data on a large scale about the minutiae of everybody's lives. This includes all forms of electronic communications, web addresses, financial and transport data, and physical movements through mobile phone location tracking. While the purpose of mass surveillance is well motivated – to detect and prevent serious crime such as terrorism and cyber-attacks on critical infrastructure – the privacy of citizens has to be balanced against societal security.

- The Group works with operators of Industrial Control Systems (ICS) such as National Grid, and the Rail Safety and Standards Board. Detailed security analysis of rail and power are conducted to identify possible points of cyber attacks whilst understanding the impact of possible failures.
- The team has also devised an e-voting system that can detect electoral fraud even if individual devices or the entire infrastructure is compromised. The Du-Vote system for internet-based voting uses a hardware token similar to the devices used for online banking, to ensure elections are secure while maintaining citizens' rights to a private ballot.