This month saw the launch of the new National Cyber Security Strategy, which was announced by the Chancellor of the Exchequer, Philip Hammond MP, during the Future Decoded conference in London. The five-year strategy will see an investment of £1.9 billion into defending UK cyber systems and infrastructure, deterring adversaries, and developing national cyber security capacity. One of the highlights of the new strategy is the creation of the National Cyber Security Centre (NCSC) as the single, central body for cyber security at a national level.

The strategy also brought excellent news for Royal Holloway’s CDT in Cyber Security: it confirmed the renewal of funding for our CDT, with a new grant of £3.45M to provide funding for three further cohorts of PhD students in cyber security. The new strategy also carried several other initiatives for promoting cyber security science and technology in the UK, such as the continuing funding of the Centres of Excellence in Cyber Security Research (ACE-CSR) and Cyber Security Research Institutes, confirming the long-term commitment of the government to supporting the UK’s cyber security academic sector.

The renewal of the CDT in Cyber Security also reaffirms Royal Holloway’s pivotal position as a national centre for cyber security education and research. The Information Security Group, established 25 years ago, is one of the largest academic cyber security research groups in the world. Royal Holloway was one of the first academic institutions in the country to be recognised as an ACE-CSR. Its highly successful MSc in Information Security programme was one of only four to gain full GCHQ certification in 2014, and now has well over 3,000 alumni around the world.

The CDT is now in its fourth year, and we have for the first time a full house: 37 CDT students divided into four cohorts, working on topics ranging from embedded security to cybercrime, from cryptography to geopolitics of security, from software security to cyber economics. In this newsletter you can learn more about what some of our CDT students have been up to.

In September, we welcomed eight new students as part of the 2016 CDT cohort. They are now going through their first year of training; you can read here about their first impressions of the CDT, and the expectations from two of them. Students from the first three cohorts are likewise busy with their research, internships and extra-curricular activities. In this newsletter you can learn about the WISDOM group, which aims to encourage diversity in the department, and in which our CDT students have been playing an active role since its formation. We also take a peek outside the ivory tower, to report the experiences and work of some of our CDT students during their summer internships. Finally we highlight some of the recent research achievements of our CDT students, including a best paper award at CCS 2016, one of the world’s top-ranked annual security conferences.

Royal Holloway has been producing PhDs in cyber security for over 30 years, with many its PhD graduates occupying senior cyber security roles in academia and industry. The launch of the CDT in 2013 has however provided a significant boost to our doctoral-level training and research programmes. It has given us the opportunity to attract and recruit excellent students to join our annual cohorts of PhD students, to work on a wide range of cyber security topics. As anyone attending one of our CDT events can attest, Royal Holloway has today one of the most vibrant and productive post-graduate environments in cyber security in the UK, and this is something that we all – CDT students and staff – can be very proud of.

I hope you enjoy learning more about it in this newsletter.

Professor Carlos Cid
Embarking upon a four-year research degree as a CDT student is both daunting and exciting. I have enjoyed meeting and getting to know the other members of my cohort and have been inspired by their wide and varied interests. However, having come from a background in mathematics, it has become obvious that mathematics has a very small role in the wider field of cyber security.

As a cohort, we have all been challenged to step outside our comfort zone and take taught courses that may be different from anything we have done in the past. I feel that this challenge has been well received by the cohort in general. This year’s cohort has also been busy taking part in other, CDT specific, activities. At the induction meeting we were tasked with giving a presentation and preparing a report on the Target Corporation financial data breach in 2013. We acted as a team of advisers to Target’s board of directors and disseminated the technical details of the breach into language that could be understood by a non-technical board member. We then gave recommendations to the board to rectify the impact of the breach and prevent further breaches. This was an interesting task as it allowed us to work together as a cohort and apply our varied knowledge base to the problem at hand.

For the remainder of the first year I am looking forward to further exploring the subject of cyber security and hope that this will lead me to a specific idea for my summer project. I am enjoying learning new things and am looking forward to continuing this over the remainder of this first year in the CDT.

Ashley Fraser, first-year CDT student
The WISDOM (Women in the Security Domain and/or Mathematics) group was set up in May 2016 to encourage diversity in the School of Mathematics and Information Security. The aims include supporting women by developing a network of female researchers, highlighting issues in the School where more could be done to encourage diversity, and encouraging more women to study in these fields, including creating an atmosphere that is welcoming to all.

Women are currently underrepresented in these areas, particularly at postgraduate level, so it’s important to take a proactive approach in recruiting female students and to develop female networks of support.

We have organised activities such as a filmed Q&A session with Professor Averil MacDonald, a fascinating insight on STEM. We also enjoyed a networking lunch with our masters students. At monthly meetings we discuss issues relevant to diversity in the department and have interesting discussions such as the use of titles in academia, and provision for students or staff with children. We have also set up a WISDOM twitter account (@WisdomRhu), Facebook group and blog where we discuss what we have done, as well as our own perspectives as female researchers.

We have recently received EPSRC funding for improving diversity. Several ideas to use this funding include a conference with female speakers, hosting a student from a developing country for a research project and an event encouraging undergraduate students to stay in academia, as well as a networking event. We are also considering ways to encourage students from lower socio-economic backgrounds into academia. We welcome anyone interested to get involved with WISDOM and would love to hear your views and ideas.

Lydia Garms, second-year CDT student, and member of WISDOM (@WisdomRhu)
Hunting your Academic Research

Earlier this year I had the privilege of taking part in the second series of the television show Hunted, which was recently broadcast on Channel 4. The show featured 10 members of the public (Fugitives), charged with the task of going on the run and evading capture for 28 days. Opposing them were a number of experts (Hunters) who could use the ‘powers of the state’ to track them down. I worked in Hunted HQ as the Lead Analyst amongst the Hunters.

We utilised several different sources of intelligence to help with this task, each of which made a unique contribution to the investigation. These included technical Intelligence such as CCTV and phone tracking, Open Source Intelligence such as information from Social Media accounts, Covert Intelligence acquired through hacking or bugging and Human Intelligence acquired from members of the public. Each of these sources was crucial but also varied in its precision, accuracy, coverage, timeliness and analytical effort. CCTV for example could provide us with an accurate and precise location of a fugitive but CCTV coverage in the countryside is poor and can only be requested for precise areas. With Human Intelligence coverage is great as humans are spread widely throughout the country but the accuracy of the information can be doubtful.

The amount of data available to us was vast and intimidating so the process of navigating through that data relied on the skills and experience of the Hunters. We needed to understand the attributes of each source, how they can be used together and how one piece of information can lead to another. We usually started with a broad search, wading through masses of information looking for elements of interest to focus in on. As the search narrowed, we collected different sources of intelligence with different attributes until eventually we could home in on our target. The process was difficult and often monotonous and it was easy to drown in data or wander off down false trails.

I found being a Hunter analogous to academic research. Research often starts with a broad interest and a researcher reads a large volume of papers before focussing on a specific topic. They might then study this in more detail before further developing their research by collecting new data. Just like for the Hunters it’s easy to get lost in information overload and it’s easy to pursue interesting but ultimately fruitless lines of enquiry. And like a Hunter, the researcher must pursue their goals doggedly but when they finally discover what they’re looking for, they will have their reward.