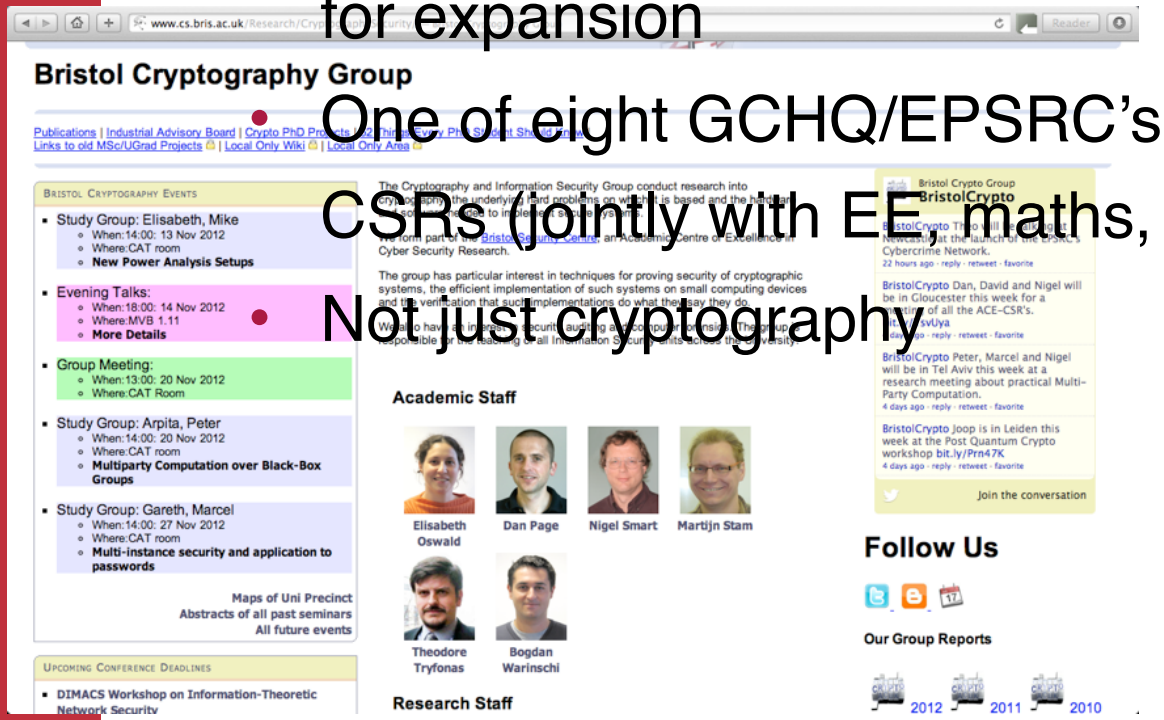
Theo Tryfonas, Cryptography Group

Cybercrime Network

Kick off meeting, Newcastle 9 Nov 2012

Bristol Crypto Group

- Largest cryptography group in the country, one of the largest in the world
- 6 academics, 12 RAs, 17 research students, plans for expansion
- One of eight GCHQ/EPSRC's accredited ACE-CSRs (jointly with EE, maths, applied psychology)
- Not just cryptography



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Current activity in the area of Cybercrime

- EU Home DG Project: Forensic Tools against Internet abuse (ForToo, HOME/2010/ISEC/AG/INT-002)
  - Open source tools for forensics in emerging networks and technologies: wireless and mobile, (mobile) social networking, IoT (sensor nets), mobile evidence visualisation
- EPSRC Leadership Fellowship (Elisabeth)
  - cryptological work, but including study of social implications of power analysis attacks

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Current activity in the area of Cybercrime
(cont'd)

- Other research in:
  - Chip-and-pin security analysis
  - Understanding malware DDoS attack strategies with game theory
  - DDoS protection via cryptographic puzzles
  - Sensor network (IoT) forensics (infrastructure, access to system integrators)

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Indicative pubs

- Andriotis, P., Oikonomou, G. and Tryfonas, T. (2012), “Forensic Analysis of Wireless Networking Evidence of Android Smartphones”, IEEE WIFS 2012
- Petroulakis, N., Askoxylakis, G. and Tryfonas, T. (2012), “Life-logging in Smart Environments: Challenges and Security Threats”,2012 IEEE ICC – WS CONWIRE
- Zaharis, A., Martini, A., Tryfonas, T. Illioudis, C. and Pangalos, G. (2011), “Lightweight Steganalysis based on Image Reconstruction & Lead Digit Distribution Analysis”, Intl Jour. of Digital Crime and Forensics, 3(4), 29-41

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Potential applications

- Using Multi-Party Computing to enable sharing of data between crime fighting agencies without revealing all the data (or any of it bar the output of the comparison)
- Looking into the feasibility of power analysis for forensic purposes (Trojan detection etc.)
- Digital evidence visualisations from various stakeholder perspectives (analysts, Jury etc.)
- **EMERGING THEME: Understanding risk from potential abuse of emerging technologies - data provenance in mobile and cloud computing (tech), system design implications (socio-tech)**

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Context

- Increased national awareness and topical interest for ‘Cyber-’ topics, e.g.
  - Situational awareness
  - Security Science
  - Program analysis (related to our area)
- But...
  - Continuously increasing challenges (Police workload, sophistication of criminal attacks, emerging threats)
  - Available forensic capability (esp. in the light of efficiencies, e.g. FSS)

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Challenge?

Engage further with Government and funders, need for further investment in this area and complement the national security perspective of existing initiatives with the '-crime' agenda

Thank you!

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