UNIVERSITY OF Southampton
School of Electronics and Computer Science

Welcome to Web Science: What's It All About?

Dr Leslie Carr

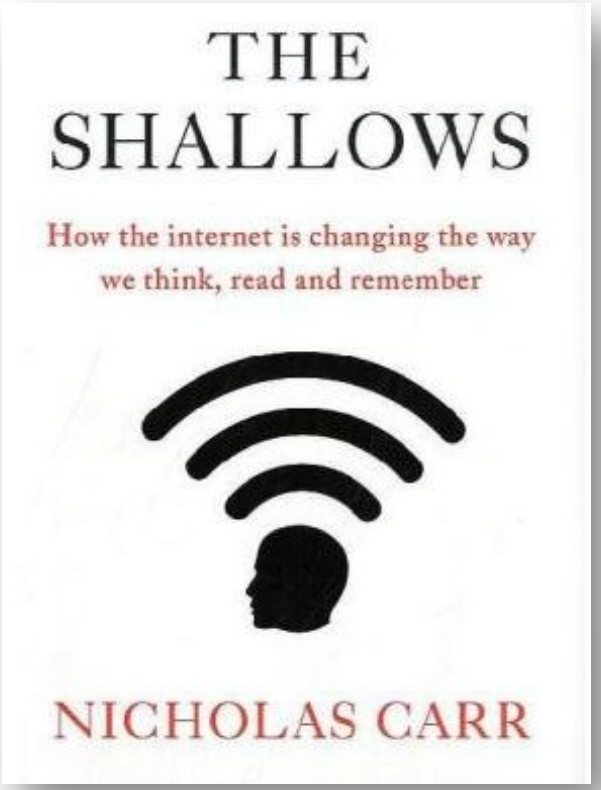
3rd October 2011

CC BY SA

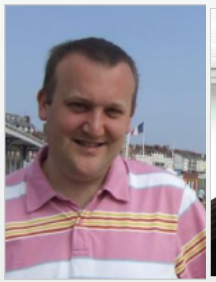
Why Web Science Matters

Why Web Science Matters

Is the Web making us weird?



Web Science at Southampton



- Web & Internet Science Research Group
- 20 Faculty Members
- Doctoral Training Centre
- Research areas include
  - OA, OER, OD, OGD
  - Semantic Web
  - Memories for Life
  - Trust, privacy and provenance
  - Learning & education

Web Science Beyond Technology

- Heath Sciences
- Sociology
- Archaeology
- Criminology
- Psychology
- Law
- Maths
- Management
- Liguistics

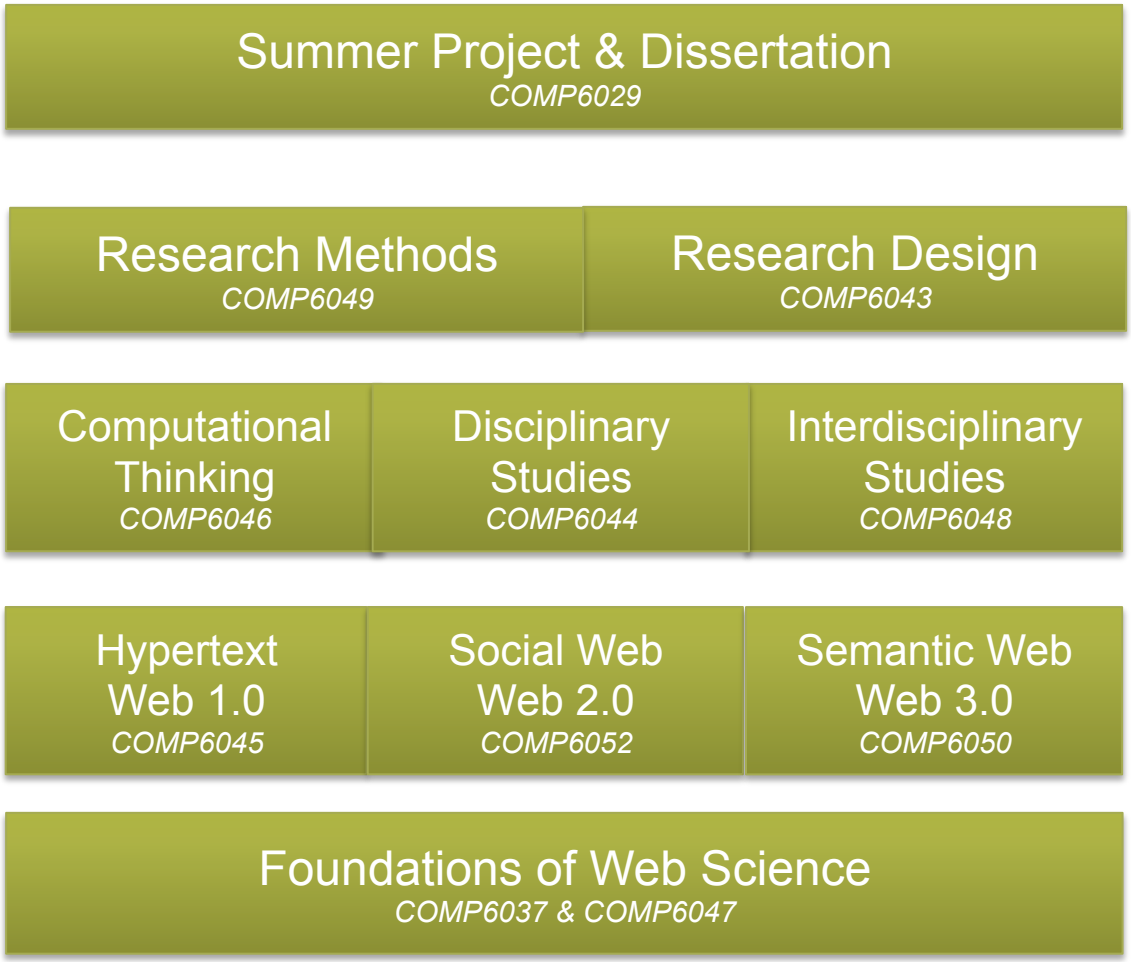
Doctoral Training Centre

- Create a cohort of web scientists
  - Leaders and advisors in the UK's Digital Economy
  - £6 million over 8 years for 50 students
  - Funded by RCUK's £250 million DE programme*
    - rcukdigitaleconomy.org.uk
- Promote a deep understanding of the Web in society
- Carry out significant research
  - analytical, practical & constructive
  - forming a hub for research investment

*A Research Councils UK cross council initiative led by EPSRC and contributed to by AHRC, ESRC, and MRC

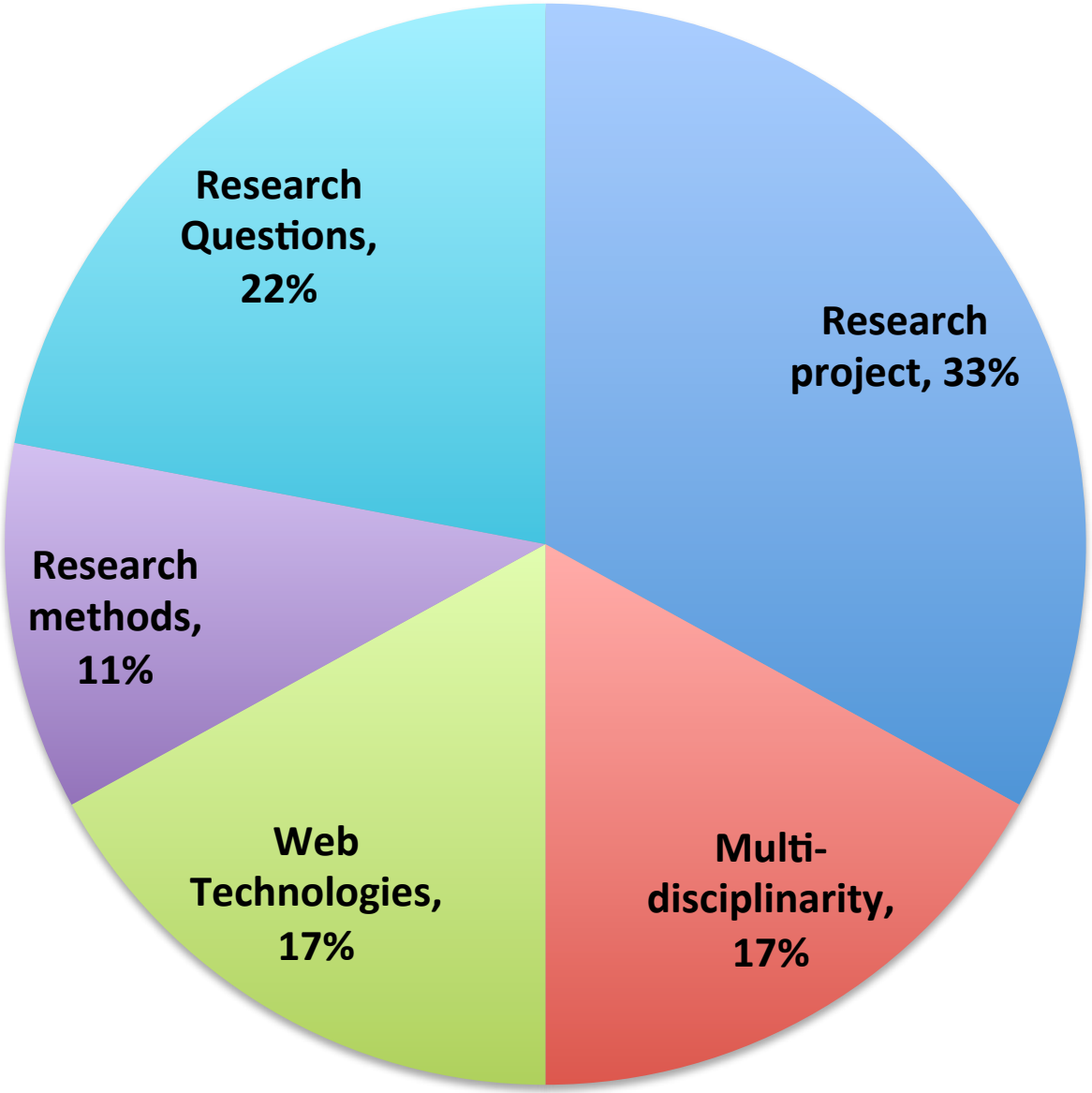
DTC Students 2011

Taught Curriculum (MSc / First Year iPhD)



5. Research project (33%)
4. Performing research (11%)
3. Multi-disciplinarity (17%)
2. Web Technologies (17%)
1. Web Science Issues (22%)

Taught Curriculum (MSc / First Year iPhD)



MSc Outcomes

UNIVERSITY OF SOUTHAMPTON COMP6047W1

SEMESTER 2 EXAMINATIONS 2010/11

FURTHER WEB SCIENCE

Duration 180 mins

This exam is based on a report to which you have been given prior access.

This exam is conducted at a computer workstation. You will have access to all the course notes and the Web. Any collaboration through email, social networking, file sharing or similar is strictly forbidden.

1. Please refer to the report entitled "Directgov 2010 and Beyond: Revolution Not Evolution" that makes recommendations for the future of the UK Government's use of the Web.

   You have been asked to brief a new Minister for Care Services (whose portfolio includes Adult Social Care, Mental Health, Physical Disabilities and Learning Disabilities) on the implications of these recommendations.

   a. From a multidisciplinary range of sources assemble and comment on relevant material that will form the evidence base for your briefing. Briefly critique each source in terms of quality and provenance. *(20 marks)*

   b. Create a comprehensive, impartial list of the pros, cons and issues for the department in terms of implementing the proposals. *(30 marks)*

   c. Write a briefing document for the minister, explaining the key issues for consideration. (Marks will be allocated for a well presented argument that integrates a range of evidence to

Race Online 2012

www.raceonline2012.org

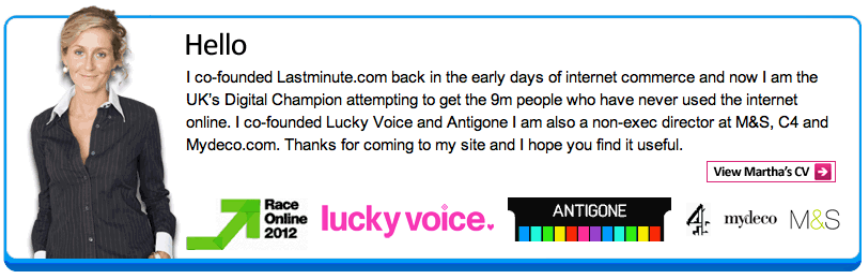
14th October 2010

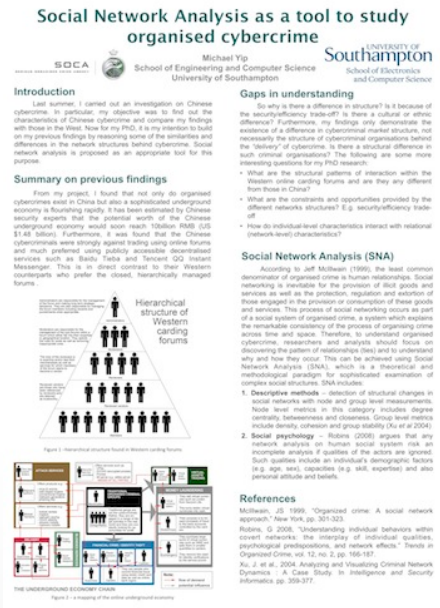
Dear Francis Maude,

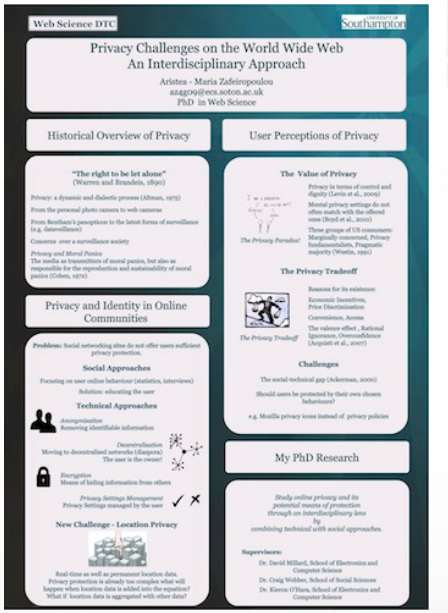
DIRECTGOV 2010 AND BEYOND: REVOLUTION NOT EVOLUTION

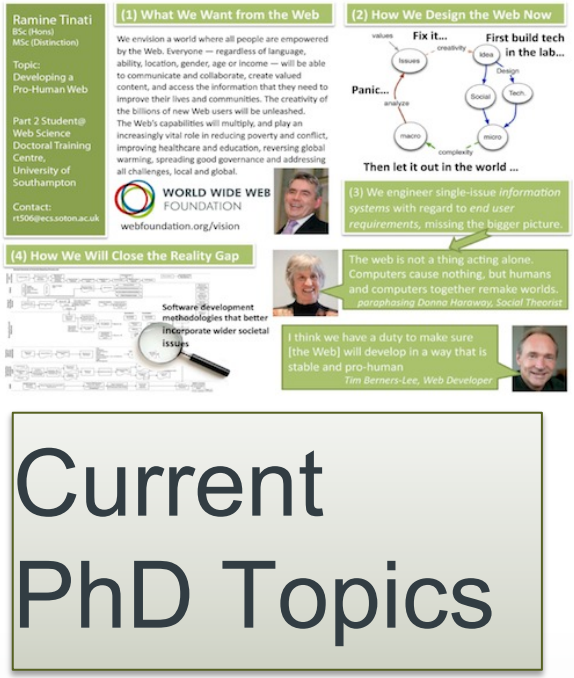
You asked me to oversee a strategic review of Directgov and to report to you by the end of September. I have undertaken this review in the context of my wider remit as UK Digital Champion which includes offering advice on "how efficiencies can best be realised through the online delivery of public services." This means that I have not reviewed Directgov in isolation but as part of how the government can use the Internet both to communicate and interact better with citizens and to deliver significant efficiency savings from channel shift. This letter sets out my findings and key recommendations.

Directgov as an organisation does two different things. It **provides access to online transactional services** such as student loans, car tax and Jobseekers' Allowance, and it **publishes government information** for citizens in one place

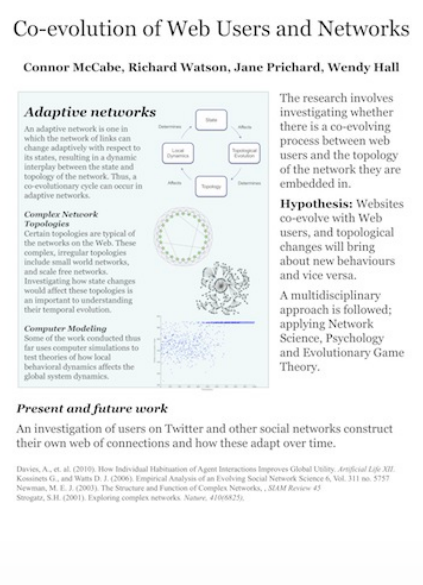


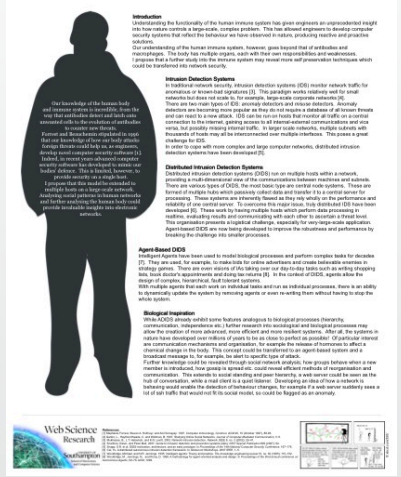


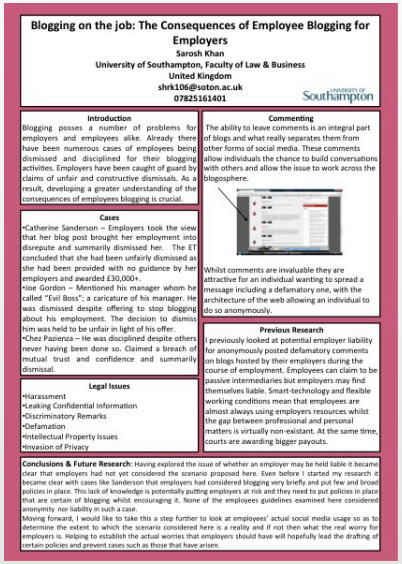


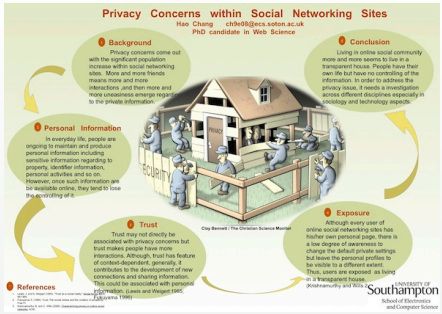


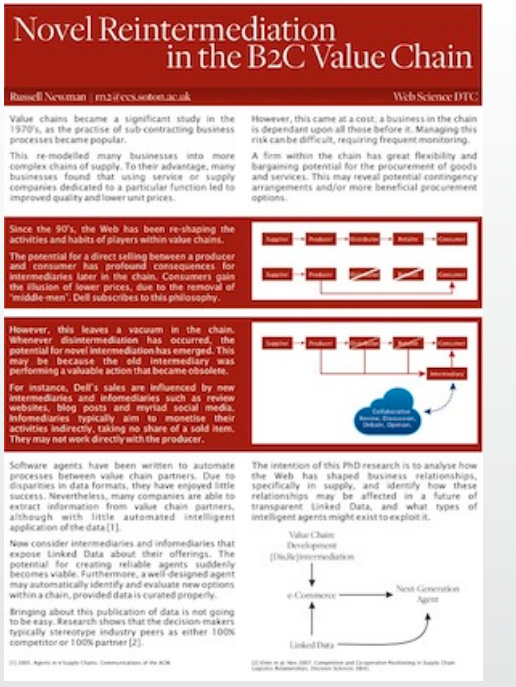
Current PhD Topics





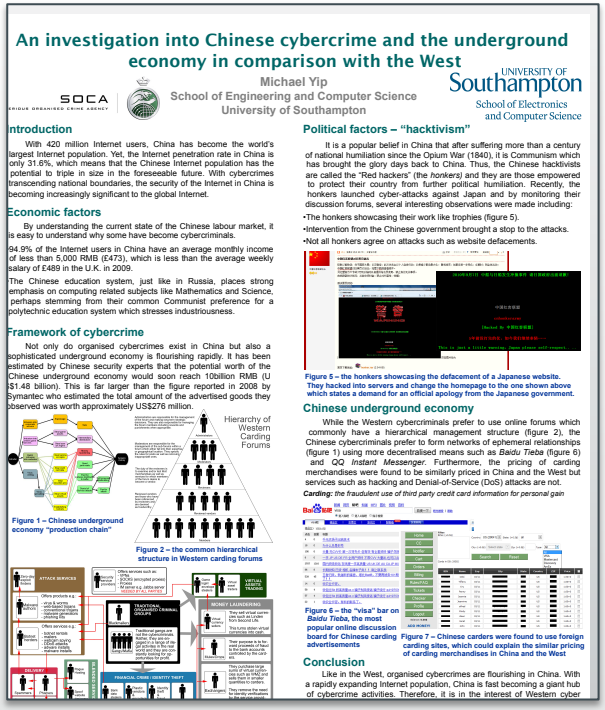






Case Study

- MSc summer project with SOCA (UK's Serious Organised Crime Agency)
  - How do patterns of online criminal activity in China deviate from those in known regions (EU, US & Russia)?
- Outcomes
  - new insight for SOCA
  - distinction at MSc
  - further collaboration
  - poster presentation at recent Royal Society workshop
  - invited speaker at Cambridge Computing Labs security group
  - dissertation requested by FBI


An investigation into Chinese cybercrime and the underground economy in comparison with the West

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School of Electronics and Computer Science

SOCA

Introduction

With 420 million Internet users, China has become the world's largest Internet population. Yet, the Internet penetration rate in China is only 31.6%, which means that the Chinese Internet population has the potential to triple in size in the foreseeable future. With cybercrimes transcending national boundaries, the security of the Internet in China is becoming increasingly significant to the global Internet.

Economic factors

By understanding the current state of the Chinese labour market, it is easy to understand why some have become cybercriminals.

94.9% of the Internet users in China have an average monthly income of less than 5,000 RMB (£473), which is less than the average weekly salary of £489 in the U.K. in 2009.

The Chinese education system, just like in Russia, places strong emphasis on computing related subjects like Mathematics and Science, perhaps stemming from their common Communist preference for a polytechnic education system which stresses industriousness.

Framework of cybercrime

Not only do organised cybercrimes exist in China but also a sophisticated underground economy is flourishing rapidly. It has been estimated by Chinese security experts that the potential worth of the Chinese underground economy would soon reach 10billion RMB (U $1.48 billion). This is far larger than the figure reported in 2008 by Symantec who estimated the total amount of the advertised goods they observed was worth approximately US$276 million.

Figure 1 – Chinese underground economy "production chain"

Hierarchy of Western Carding Forums

Figure 2 – the common hierarchical structure in Western carding forums

Political factors – "hacktivism"

It is a popular belief in China that after suffering more than a century of national humiliation since the Opium War (1840), it is Communism which has brought the glory days back to China. Thus, the Chinese hacktivists are called the "Red hackers" (the *honkers*) and they are those empowered to protect their country from further political humiliation. Recently, the honkers launched cyber-attacks against Japan and by monitoring their discussion forums, several interesting observations were made including:

- The honkers showcasing their work like trophies (figure 5).
- Intervention from the Chinese government brought a stop to the attacks.
- Not all honkers agree on attacks such as website defacements.

Figure 5 – the honkers showcasing the defacement of a Japanese website. They hacked into servers and change the homepage to the one shown above which states a demand for an official apology from the Japanese government.

Chinese underground economy

While the Western cybercriminals prefer to use online forums which commonly have a hierarchical management structure (figure 2), the Chinese cybercriminals prefer to form networks of ephemeral relationships (figure 1) using more decentralised means such as *Baidu Tieba* (figure 6) and *QQ Instant Messenger*. Furthermore, the pricing of carding merchandises were found to be similarly priced in China and the West but services such as hacking and Denial-of-Service (DoS) attacks are not.

Carding: *the fraudulent use of third party credit card information for personal gain*

Figure 6 – the "visa" bar on *Baidu Tieba*, the most popular online discussion board for Chinese carding advertisements

Figure 7 – Chinese carders were found to use foreign carding sites, which could explain the similar pricing of carding merchandises in China and the West

Conclusion

Like in the West, organised cybercrimes are flourishing in China. With a rapidly expanding Internet population, China is fast becoming a giant hub of cybercrime activities. Therefore, it is in the interest of Western cyber

Web Science Network of Laboratories

The **Web Science Network of Laboratories (WSTNet)** combines some of the world's leading academic researchers in Web Science, with new academic programmes that will enhance the already growing influence of Web Science. The member Labs will provide valuable support for the ongoing development of Web Science. There are ten founding WSTNet labs.

Web Science across continents

- Astronomers obtain a very high resolution picture of the sky from small telescopes a long distance apart.
- Many web labs, contributing across the globe, help build an accurate picture of human activity at planetary scale.
  - *transcending parochial social, political, economic, legal interpretations*