Cybercrime and its Future
Cybercrime and its Future

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1. Introduction

2. Trends in Cybercrime

3. Recent Technological Developments

4. Conclusions
1. Introduction
Peter Grabosky

CYBERCRIME

KEYNOTES IN CRIMINOLOGY AND CRIMINAL JUSTICE SERIES

OXFORD UNIVERSITY PRESS
Motives
Opportunities
Guardians
Motives for cybercrime are hardly new:

- Greed
- Lust
- Power
- Revenge
- Curiosity
- Excitement
- Rebellion
- Intellectual Challenge
- Self Defence
- Ideology
Internet Users in the World

Year (as of July 1)

Source: Internet Live Stats
Internet Users in the World
by Geographic Regions - June 30, 2018

- Asia: 2062
- Europe: 705
- Africa: 465
- Latin America / the Caribbean: 438
- North America: 345
- Middle East: 164
- Oceania / Australia: 28

Source: Internet World Stats - www.internetworldstats.com/stats.htm
Basis: 4,208,571,287 Internet users estimated in June 30, 2018
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Internet World Penetration Rates by Geographic Regions - June 30, 2018

- North America: 95.0%
- Europe: 85.2%
- Australia / Oceania: 68.9%
- Latin America / Caribbean: 67.2%
- Middle East: 64.5%
- World, Avg.: 55.1%
- Asia: 49.0%
- Africa: 36.1%

Source: Internet World Stats - www.internetworldstats.com/stats.htm
Penetration Rates are based on a world population of 7,634,758,428 and 4,208,571,287 estimated Internet users in June 30, 2018.
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Human Guardianship

• Parents
• Teachers
• Systems Administrators
• Individual Users
Technological Guardianship

• Filtering Software
• Anti-Virus Software
• Authentication Technologies
• Credit Card Algorithms
What is Cybercrime?
Unauthorised Access
Interference with Lawful Use
Prohibited Content
Theft/Destruction of Data
Damage to Systems
Unauthorized access (Hacking)
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</tr>
<tr>
<td>48</td>
<td>tigger</td>
</tr>
<tr>
<td>49</td>
<td>charlie</td>
</tr>
<tr>
<td>50</td>
<td>robert</td>
</tr>
</tbody>
</table>
Theft of Information Services
Identity Theft
Information Piracy
Counterfeiting
Forgery
Possession/Dissemination of Offensive Materials
Online Child Exploitation
Stalking & Bullying
Extortion
1. Communicate a threat
2. Target computer systems
3. Medium of blackmail
4. Digital payment
5. Intelligence about victims
Electronic Funds Transfer Fraud
2016 Theft of **US$81,000,000**

Bangladeshi funds deposited in US Federal Reserve system
Electronic Money Laundering
Philippines

Bank secrecy laws-strong

Cash transaction reporting-weak
Casinos *exempt* !!
Advance Fee Fraud
Dear Email Beneficiary,

We wish to inform you that you are one of the seven email beneficiaries approved to receive the sum of $1,500,000.00 USD in the on-going UN Humanitarian aid / Poverty Alleviation Program (UNPAP) 2016.

The United Nations’ Organisation has deposited your funds with us at the Western Union Payout Center in Malaysia, and they have contracted us to take full responsibility in the transfer process of the funds to all seven beneficiaries. They have now ordered us to take full responsibility in the transfer process of your funds and thus commence the immediate remittance of your funds to you. Be strongly informed that because of our Western Union transfer policy, your funds will be paid to you via our Western Union Daily Transfer limit of $7,600USD. This means that you will continuously receive a daily amount of $7,600USD USD from us, and this amount can be collected from any of our numerous Western Union outlets in your current location.

To begin receiving your daily payment as stated above, we need you to provide us with; Your Full Name, Address, and Phone Number. Upon receipt of the requested details.

Your first transaction will be activated and we shall then proceed to provide you with the Money Transfer Control Number (MTCN) for the first installment, and we will continue to email you others after 24 hours of receiving each payment.

For more information on your payment status: Call Tony Yung on our 24 hours phone helpline @ +601-0248-4297 and reply to this message via: wumaiaccess09@my.com for inquiries on this message.

Yours truly,
Western Union Malaysia
Romance Fraud
My name is Gavin. I'm 45 years old, from the US. I'm in Syria right now fighting IS. I want to get to know you better, if I may be so bold. I consider myself an easy-going man, and I am currently looking for a relationship in which I feel loved. Please tell me more about yourself, if you don't mind.
Sales and Investment Fraud
Business Interest
William Leung kchengc@cuhk.edu.hk

I have a business for you worth 24.5m usd, reply (willieleu2@gmail.com) for more details.

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This email has been checked for viruses by Avast antivirus software.

https://www.avast.com/antivirus
Ransomware Fraud
(Fraud+Extortion)
YOUR COMPUTER HAS BEEN LOCKED!

Your computer has been locked due to suspicion of illegal content downloading and distribution.

The illegal content (414 Mb of photo and video files) was automatically classified as child pornographic materials.

The downloading and distribution of illegal content, in whole or in part, violate following U.S. Federal Laws:

18 U.S.C. § 2251 Sexual exploitation of children (Production of child pornography)

18 U.S.C. § 2252 Ceratin activities relating to material involving the sexual exploitation of minors (Possession, distribution and receipt of child pornography)

18 U.S.C. § 2252A Ceratin activities relating to material constituting or containing child pornography

Any individual who violates, or attempts to violate, or conspires to violate mentioned laws shall be sentenced to a mandatory term of imprisonment from 6 months to 10 years and shall be fined up to $250,000.

Collected technical data

Your IP address: [redacted]
Your host name: [redacted]
Source or intermediary sites: [redacted]
Location: [redacted]

Illegal content found:

[Images of illegal content]

ALL SUSPICIOUS FILES FROM YOUR COMPUTER WERE TRANSMITTED TO A SPECIAL SERVER AND SHALL BE USED AS EVIDENCES. DON'T TRY TO CORRUPT ANY DATA OR UNBLOCK YOUR COMPUTER IN AN UNAUTHORIZED WAY.

Your case can be classified as occasional/unmotivated, according to 17 (U.S. Code) §512

Thus it may be closed without prosecution.
Your computer will be unblocked automatically.

In order to resolve the situation in an above-mentioned way you should pay a fine of $300

Exchange your cash for a MoneyPak voucher and use your voucher code in the form below:

Code: [Input field]

Status: Waiting for payment
Permanent lock on 09/20/2013 8:46 p.m. EST

Where can I buy MoneyPak:

- Rite Aid
- CVS pharmacy
- kmart
- 7 eleven
- Walgreens
- Walmart
The Australian Federal Police is a progressive and multi-faceted law enforcement organisation taking a strong lead in the fight against 21st century crime.

You've received a subpoena

You are invited to the law court by the judge because of crime commitment.

Case: #256101
Date: 01/03/2016

Please visit nearest police office or view case notices.

Download case info

You must provide all the necessary information to the Court within 15 days, starting from the time at which this message was received. If the information is not provided, the court can take place without your participation.
Financial Hoaxes
Illegal Interception or Disclosure of Information
Communications in Furtherance of Criminal Conspiracies
Electronic Vandalism & Terrorism

Cyber Warfare
What’s New?

Greater diversity of activity within these generic crime types

Greater diversity of targets and attack vectors
2. Trends
What’s New?

Sophisticated
Commercialized
Diversity of Organizational Form

State and State-Sponsored
Sophistication:
More skillful exploitation of trust
You'll be shocked to learn these 3 things your doctor isn't telling you.

8 things super hot women look for in a guy.

This dog befriended a sea urchin. What happens next will amaze you.

“What is this - some kind of new bait?”
More skillful exploitation of trust
Bigger, Better Botnets
Figure 1-1: DDOS attack architecture
More skillful exploitation of trust
Bigger, Better Botnets
Greatly Improved Malware
More skillful exploitation of trust

Bigger, Better Botnets

Greatly Improved Malware

Crime on a Much Larger Scale
Skillful use of digital technology by terrorist groups and by organized criminal groups

Islamic State (*Wired*, April 2016); Zetas
Recruitment
Propaganda
Fundraising
Tactical Communications
In the name of Allah, the Most Gracious, the Most Merciful, the CyberCaliphate continues its CyberJihad.
“Los Zetas are deploying their own teams of computer experts to track those individuals involved in the online anti-cartel campaign…”

(Stratfor 2011)
Offensive countermeasures
Cyber-operations
Psychological warfare
Commercialization:
Hackers for Hire
Hackers for Hire
Botnets for Rent
Hackers for Hire
Botnets for Rent
Malware Bazaars
Hackers for Hire
Botnets for Rent
Malware Bazaars
DDoS Services
Updates and User Support for Exploit kits
Updates and User Support for Exploit Kits

Markets for Undiscovered Flaws in Computer Code (Zero Day Exploits)
Diversity of Organizational Structures:
State and State-sponsored Cybercrime
Offensive Cyber Operations
State, or State-Sponsored

Espionage
Sabotage
Disruption
Estonia/Ukraine/Georgia/USA (Russia) 2007 2008 2015 2016

Stuxnet (USA + Israel) 2010

Saudi Aramco (Iran) 2012

Industrial/Economic Espionage (China) 2013

Sony Pictures (DPRK) 2014

Bangladesh Central Bank (DPRK) 2016

Wannacry (DPRK) 2016

North Korean Missile Tests (USA) 2017
The statue that sparked the first cyber war
"Stuxnet"
Stunning complexity and sophistication

Using 4 “zero day” exploits
Commandeered industrial control system while hiding the fact

Disabled alarms while signalling that systems were operating normally.

A “game changer” in cyber security
COUNTDOWN TO ZERO DAY
STUXNET AND THE LAUNCH OF THE WORLD'S FIRST DIGITAL WEAPON

KIM ZETTER
Home of China PLA's Unit 61398
Oops, your files have been encrypted!

What Happened to My Computer?
Your important files are encrypted. Many of your documents, photos, videos, databases and other files are no longer accessible because they have been encrypted. Maybe you are busy looking for a way to recover your files, but do not waste your time. Nobody can recover your files without our decryption service.

Can I Recover My Files?
Sure. We guarantee that you can recover all your files safely and easily. But you have not so enough time. You can decrypt some of your files for free. Try now by clicking <Decrypt>. But if you want to decrypt all your files, you need to pay. You only have 3 days to submit the payment. After that the price will be doubled. Also, if you don’t pay in 7 days, you won’t be able to recover your files forever. We will have free events for users who are so poor that they couldn’t pay in 6 months.

How Do I Pay?
Payment is accepted in Bitcoin only. For more information, click <About bitcoin>. Please check the current price of Bitcoin and buy some bitcoins. For more information, click <How to buy bitcoins>. And send the correct amount to the address specified in this window. After your payment, click <Check Payment>. Best time to check: 9:00am - 11:00am GMT from Monday to Friday.

Send $600 worth of bitcoin to this address:

12t9YDPgwueZ9NyMgw819p7AA8isjr6SMw

Contact Us

Check Payment  Decrypt
State- “Sponsored”:
Russian Hackers
1. Attack anything you like, as long as it is outside of Russia
2. If you encounter information that may be useful to the Russian State, please let us know.
3. When patriotic duty beckons, please heed the call.
Plausible Deniability
China
Estonia
Georgia
India
Iran
Saudi Arabia
South Korea
United States
State Ignorance
State Incapacity
“Blind Eye”
Tacit Encouragement
Active Sponsorship
Formal Collaboration
State Monopoly
4. Recent Technological Developments
Mobile Telephony
Wireless Internet
Cloud Computing
Voice-over Internet Protocol
Social Media
Further into the future:

“The Internet of Things”

Interconnectivity
50 Billion interconnected devices worldwide by 2020
Remote car hijacking

https://www.youtube.com/watch?v=MK0SrxC1xs
Vulnerability of Weapons Systems
WEAPON SYSTEMS

CYBERSECURITY:

DOD Just Beginning to Grapple with Scale of Vulnerabilities


“Big Data”

a tool for criminals
Further into the future:

“The Internet of Things”

Brain-machine Technology
Matador’ With a Radio Stops Wired Bull

Modified Behavior in Animals Subject of Brain Study

By JOHN A. OSMUNDSEN

Afternoon sunlight poured over the high wooden barriers into the ring as the brave bull bore down on the unarmed “matador” — a scientist who had never faced a fighting bull. But the charging animal’s horns never reached the man behind the heavy red cage. Moments before that could happen, Dr. José M. R. Delgado, the scientist, pressed a button on a small radio transmitter in his hand, and the bull braked to a halt.

Then, he pressed another button on the transmitter and the bull obediently turned to the right and trotted away.

The bull was obeying commands from his brain that had been called forth by electrical stimulation — by the radio signals of certain regions in which fine wire electrodes had been painlessly implanted the day before.

The experiment, conducted last year in Cordova, Spain, by Dr. Delgado of Yale University’s School of Medicine, was probably the most spectacular demonstration ever performed of the deliberate modification of animal behavior through external control of the brain.

Dr. Delgado was trying to find out what makes brave bulls brave — just as other of his experiments have aimed at finding the biological basis for emotions, personality and behavior in man and other animals through electrical stimulation of their brains.

He has been working in this field for more than 15 years, standing of the biological bases of social and antisocial behavior and of mental activities which for the first time in history, he believes, "a radio can now be explored in a turning point has been reached in the study of the mind."

"I do believe," he said in a recent lecture, "that an understanding of the atom and of our present anxieties, frustrations and conflicts."

Dr. Delgado said in an interview recently that he was particularly concerned with what he called the "gap between our understanding of the atom and..."
Regulatory Institutions Network
College of Asia and the Pacific
Further into the future:

“The Internet of Things”

Brain-machine Technology

Brain-to-Brain Technology
5. Conclusions
Crime Follows Opportunity
Every New Technology
Every New Application
is vulnerable to criminal exploitation
It is theoretically possible for someone with just a laptop to:

- Commandeer an aircraft
- Put a virus into flight control computers
- Jeopardize the safety of the flight by taking control of computers
- Take over the warning systems or even navigation systems

US Government Accountability Office 2015
EVERYTHING IS CONNECTED,
EVERYONE IS VULNERABLE
AND WHAT WE CAN DO ABOUT IT

FUTURE CRIMES

MARC GOODMAN
DARK TERRITORY
THE SECRET HISTORY OF CYBER WAR
FRED KAPLAN
AUTHOR OF THE INSURGENT
Solutions:
How best to achieve security and prosperity in Cyberspace?
Security Consciousness
Security Consciousness
Resources
Security Consciousness
Resources
International Co-operation
Security Consciousness
Resources
International Co-operation
Substantive Criminal law
Security Consciousness
Resources
International Co-operation
Substantive Criminal law
Laws of Criminal Procedure and Evidence
Budapest Convention

https://www.coe.int/en/web/cybercrime/the-budapest-convention
Successful models of Co-operation
China-Taiwan Fraud Investigation (2012)
Silk Road 2.0 Takedown (2014)

Bulgaria, Czech Republic, Finland, France, Germany, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Romania, Spain, Sweden, Switzerland, United Kingdom, United States
Pluralistic Cybersecurity

Governments
Private Industry
Civil Society

(Better communication within and between these sectors)
More Secure Software
More training and education for police; prosecutors; judges; citizens
More international cooperation
  - Harmonization of laws (substantive criminal law; criminal procedure laws)
  - Cross-border investigations
  - Bridging the digital divide
Santayana (1863-1952):

Those who forget the past are condemned to repeat it.
Those who fail to anticipate the future are in for a rude shock when it arrives.
Thank You !
Peter.Grabosky@anu.edu.au

http://Regnet.anu.edu.au