15. Mental Models; User Education

Blase Ur, May 15th, 2017
CMSC 23210 / 33210
Today’s class

• Logistics: projects + midterm 2
• Mental models
• User education
• Discuss midterm
• (Maybe) CHI 2017 Passwords Talk
Mental Models
Mental Models Study

Rick Wash, “Folk Models of Home Computer Security” (SOUPS 2010)
Wash 2010

- How uses *perceive* and *understand* computer security
- Understand the *mental models* of users
Wash 2010

- 33 semi-structured interviews
- About 45 minutes each
- Broad questions
- Hypothetical scenarios
Wash 2010

• Folk models used to decide whether to follow security advice

• For example, “Use anti-virus software” was viewed as *important* to users who saw viruses as supporting crime and *less important* to users who viewed viruses as buggy software
Wash 2010: Viruses

- “Virus” as general term for malware
- Generically bad
- Buggy software
- Virus as annoyance
- Support crime
- Multiple of the above
Wash 2010: Hackers

• “Hacker” term used for malicious actors
• Digital graffiti artists
• Burglars
• Criminals who target valuable targets
• Contractors who support criminals
• Multiple of the above
Wash 2010

• Main takeaway: How users perceive threats can affect their security-related behavior.

• Users often do not understand threats the same way that sophisticated users do.

• Users may take actions that only make sense if you understand their behavior.
Software Updates

Java Update Available
A new version of Java is ready to be installed.

Java Update - Update Available

Java Update Available
Java 6 Update 22 is ready to install. Click the Install button to update Java now. If you wish to update Java later, click the Later button.

More information...
Software Updates


• Update = New features? Or security fix?
Expert vs. Non-Expert Mental Models

Expert vs. Non-Expert Mental Models

• What are the top three things you do to stay safe online?
• Experts
  – Update system
  – Use unique passwords
  – Use strong passwords
  – Two-factor auth
  – Password manager
  – Check if HTTPS
Expert vs. Non-Expert Mental Models

• What are the top three things you do to stay safe online?

• Non-experts
  – Anti-virus
  – Use strong passwords
  – Visit only known websites
  – Change passwords
  – Don’t share information
  – Use unique passwords
Drawing Mental Models

Internet Scams

User Education
Why Does Phishing Work?


• How do you tell if a site is legitimate?

• How do you tell if an email is legitimate?
Legitimate or Phish?
Legitimate or Phish?
How To Avoid Online Scams

Notice that the URL in your browser’s address bar has several parts.

Prefix  Address  File Name

http://www.wombank.com/wombank.html
How Do You Tell if a Prince Is Legit?