How To Design Usable and Secure CAPTCHAs?

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July 26, 2011

Abstract:
In his 1950 paper Computing Machinery and Intelligence, Alan Turing proposed what became the standard way for a human to test a computer's ability to demonstrate intelligence. In the Turing test, a human judge engages remotely in a natural language conversation with one human and one machine, each of which tries to appear human. If the judge cannot reliably tell the machine apart from the human, the machine is said to have passed the test. Sixty years later, telling humans apart from machines has become a critical problem in Internet security -- but the judge is a machine, not a human. These reverse Turing tests, or captchas (Completely Automated Public Turing tests to tell Computers and Humans Apart), form websites' first line of defense against automated abuse such as sending spam and creating fake accounts.

Over the last two years we made significant progress in understanding what make good Turing tests in term of security and usability. On the security side, I will present our captcha evaluation framework Decaptcha, that implement the novel attacks techniques we developed to attack image based and audio based captchas. Decaptcha effectiveness at finding captcha flaws will be illustrated on popular captchas including Microsoft, Yahoo, Baidu, eBay, Slashdot and Blizzard ones. On the usability side, I will share with you the insights we gained by studying how people reacted to various captcha schemes we designed. Overall we analyzed more than 2 millions user attempts at solving captcha.

About the Speaker:
Elie Bursztein is a postdoctoral researcher at the Stanford Security Laboratory. His research is on computer security and applied cryptography with a specific attention to web, game and mobile security. He holds an engineering degree from EPITA and a Ph.D in computer science from the ENS-Cachan. Elie’s research combines the advances in machine learning, cryptography, data mining and HCI to create more usable and secure systems. Lately, he has been working on improving CAPTCHA security and usability. He is also developing many security related software including Webseclab an online environment to teach web security, Webshield a Chrome extension for safer and more private browsing and OWADE a windows forensic tool. Elie blogs at [http://elie.im/blog](http://elie.im/blog) and tweets at [@elie](http://twitter.com/elie).