

Expert and Non-expert Viewing Patterns When Seeking Security Cues

Purpose

Phishing scams cost people millions of dollars worldwide. While they may be difficult to recognize, previous studies have found that technical knowledge helps reduce the risk of falling for phish. What enables computer experts to identify malicious websites that novices are not able to identify? Are they looking at the security cues provided by the web browser, or are they simply using implicit knowledge? In our study, we will use eye-tracking to identify exactly where experts and non-experts are looking when they are browsing the web.

Hypothesis

While the order in which experts look at security indicators may be random, we anticipate that experts' viewing patterns will be heavily concentrated in key security areas. We also expect experts to be able to quickly find the security indicators as they know where to look and what to look for. Meanwhile, we predict that novices may glance at one or two security cues, but their viewing patterns will generally be random.

Goals

- Examine differences in information-seeking behaviors of experts and non-experts through eye-tracking
- Evaluate differences between actual eye movements and self-reported evaluation
- Create a training program in order to increase technical knowledge of non-experts

Methodology

Participants will be asked to perform a series of tasks on the web as we record the movement of one of their eyes with an eye-tracking headgear. Tasks include: posting a review on CNN, rating movies, signing into email accounts—all through Facebook. After running the eye-tracking experiment, we will ask participants to fill out a survey.

Experts will be recruited from second year graduate students in the Masters of Security Informatics program at Indiana University and graduate students in Information Technology in Queensland University of Technology in Australia. Non-experts will be recruited from the local Farmer's Market in Bloomington, Indiana.

Progress

- Submitted grant proposals
- Submitted forms for IRB approval; awaiting reply
- Practice with eye-tracker and data analysis software

Limitations

While we hope that our results will closely represent the true population, there are several limitations to our study:

- The use of fake accounts does not simulate a real situation as there are no real risks.
- Participants may be unfamiliar with our selected (control) web browser and computer system, so results may not accurately represent their usual viewing patterns.
- Restricted ability to run data analysis for a large group of people leads to a lack of statistical power.