

GUEST LECTURE ANNOUNCEMENT
Computer Science Department - University of Crete
Seminar Series:
CyberSecurity in Spring: The Spring of CyberSecurity



Evasive Threats on the ever-evolving Web

by **Alex Kapravelos, North Carolina State University**

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Host: Evangelos Markatos, Computer Science Department, University of Crete

Abstract

The browser is one of the most critical software used today. Billions of people from a plethora of devices depend on browsers to explore the web, a process that involves fetching, compiling and executing code from websites. Browsers add new features constantly, which triggers updates on webpages to leverage them. This fantastic interplay of software evolution between browsers and the web shifts constantly the security landscape and makes the web harder to study and measure, as it constantly evolves.

In this talk I will focus on evasive threats that rise from the evolution of the web. We will talk about the state of the art in client-side cloaking techniques in phishing, like fake CAPTCHAs and crawler fingerprinting. Based on these findings, we will observe how limited our knowledge is regarding the functionality that is executed in the browser when we visit a page. To improve our understanding of web behavior, we will explore VisibleV8, a custom variant of the V8 JavaScript engine that logs native function or property accesses during any JS execution. We will leverage VisibleV8 to explore different web behaviors, from bot detection to code obfuscation. Finally, I will talk about my vision of the next-generation web behavior measurements and building malicious behavior detection systems.

Short Biography

Alexandros Kapravelos is an Assistant Professor in the Department of Computer Science at North Carolina State University. He received his PhD in Computer Science from University of California, Santa Barbara in 2015. His research interests span the areas of systems and software security. Currently, he studies how the web and the browser evolve over time and how we can make the browser more secure in the future. He is also interested in online privacy and browser fingerprinting specifically, where he is working on making internet users less distinctive while they browse the web. Together with the Order of the Overflow team, he organized for four years DEF CON CTF (2018-2021), the oldest and most prestigious Capture The Flag security competition that attracts tens of thousands of participants every year. He is the recipient of the NSF CAREER award in 2021 and two best paper awards from the IEEE Symposium on Security and Privacy.