



Department of Computer Science

A Holistic View of Internet Security

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Hosted by Cristian Borcea and Kasthuri Jayarajah

Date: Monday, April 8, 2024

Coffee: 2:15 PM – 2:30 PM

Time: 2:30 PM – 3:30 PM

Location: GITC 4402 (4th floor Seminar Lecture Hall)

Zoom Link: <https://njit-edu.zoom.us/j/94093916318?pwd=NUx6bVc5R3ZyQklXS1F4czBzQ0pOdz09>

Abstract:

The Internet ecosystem consists of various interconnected infrastructures, protocols, and services that depend on each other for seamless operation. Despite rigorous security analyses of individual components, security challenges can arise from the interaction between components, highlighting the need for a holistic approach to Internet security. In this talk, I will explore security threats affecting major Internet components and the innovative defenses developed to mitigate these challenges. Specifically, I'll first demonstrate how cross-boundary attacks targeting encrypted network traffic (i.e., traffic analysis) can compromise the security and privacy of applications at higher layers and introduce a novel defense mechanism. Next, I'll concentrate on serverless computing and present a new system designed to enhance the security of serverless applications. Lastly, I will discuss cross-layer routing attacks against public key infrastructure, highlighting a practical defense that has been successfully deployed at Let's Encrypt since 2020 and is progressing toward becoming an Internet standard.

Bio:

Liang is an Associate Research Scholar at Princeton University. He received his Ph.D. in Computer Science from the University of Wisconsin-Madison in 2018. His research interests lie in Internet security and privacy. His research focuses on using data-driven approaches to understand how major Internet components function in practice, identifying cross-boundary attacks, and developing practical and incrementally deployable defenses. His work was awarded the Caspar Bowden Award for Outstanding Research and Best Student Paper Runners-up at PETS 2022, and has been recognized in various ways (adoptions, invited talks, etc.) by industry leaders such as Google, Cloudflare, and Intel.