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Computer Science Seminar Series

National Capital Region

How Hard Is It for Networks to Run Themselves?

Speaker: Prof. Alan Zaoxing Liu

University of Maryland, College Park
Friday, February 16, 2024
11:15AM– 12:15PM, NVC 213

Abstract

Emerging networked applications, such as AI services, 5G/6G RAN, Internet of Things (IoT), autonomous driving, and extended reality (XR), demand highly performant, reliable, and secure network infrastructures. In response to these demands, many efforts envision an ambitious "self-driving workflow" for network management that makes real-time control decisions to meet the needs of applications. Just like self-driving cars, self-driving networks should be able to "see," "analyze", and "control" diverse network behaviors to achieve high performance, reliability, and security going forward. In this talk, I will discuss the challenges of letting networks run themselves and how our research enables a viable pathway to tackle these challenges. First, I will discuss how we can provide accurate and real-time observability of diverse application-level metrics on heterogeneous network platforms (e.g., programmable switches and end hosts). Second, with real-time observability, I will describe a case study on when the networks can run themselves to defend against distributed denial-of-service attacks. Finally, I will chart paths to designing future AI tools for network operations.

Biography

Dr. Alan Zaoxing Liu is an Assistant Professor of Computer Science at the University of Maryland, College Park. His work spans computer networks, systems, and security to co-design performant, reliable, and secure analytics solutions across the computing stack. His recent research focuses on designing scalable and trustworthy approximate computing systems. He received the best paper award at USENIX FAST'19 and interdisciplinary recognitions, including ACM STOC "Best-of-Theory" plenary talk and USENIX ATC "Best-of-Rest". He served various technical and organizational committees, such as SIGCOMM, NSDI, CCS, IMC, CoNEXT, and SOSP. He was a postdoctoral researcher at Carnegie Mellon University Cylab and obtained his Ph.D. in Computer Science from Johns Hopkins University.