Stimulating Intelligence in the Mobile Networked Systems

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Abstract

The mobile networked systems (4G and upcoming 5G) are at a critical stage of the technology revolution. Despite offering working solutions for billions of users, they are complex and closed: The infrastructure lacks guarantees for the correct designs and operations, while the mobile client lacks the insights of the "black-box" network behaviors. Both fundamentally limit our understanding of why various problems happen, and how to resolve them.

In this talk, I describe primitives that stimulate more infrastructure and client intelligence. For the infrastructure, I present verification and state management techniques that enforce provably correct designs and operations. For the client, I show how a data-driven system design allows it to be more active in improving the performance, reliability, and security. These results suggest that the future systems (5G and beyond) should be equipped with more intelligence, and make themselves easy to understand and use.

Bio

Yuanjie Li is a Ph.D. candidate in Computer Science at UCLA, advised by Professor Songwu Lu. His interests include the networked systems, mobile computing, and their security. He has won ACM MobiCom16 Best Community Paper Award and UCLA Dissertation Year Fellowship in 2016. His work has resulted in an open-source community tool (MobileInsight) used by 130 universities and companies so far.

Faculty Host: Richard Martin