Computer Science Seminar

Data-Oriented and Trustworthy IoT Services for a Cyber-Physical World

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10:00 - 10:50 am
209 Computer Science Building
Refreshments will be served at 9:45 am outside CS209

The Internet-of-Things (IoT) has the potential to revolutionize our daily lives. Yet, we are facing major challenges in deploying IoT to solve real-world problems. On one hand, the huge volume of data generated by IoT devices must be transmissible and comprehensible by our existing infrastructures. On the other hand, the complexity, heterogeneity and scale of IoT-based systems have led to new security risks in our digital or even physical lives. Resolving these challenges require sophisticated computing and analytical mechanisms in data science, machine learning, cybersecurity, and/or social sciences, but the applicability of these mechanisms in IoT is largely restricted by the limited computing, networking and energy resources in many real-world IoT scenarios.

In this talk, I will focus on my efforts in addressing the above challenges in resource-constrained IoT. To solve the big data challenge, I design algorithmic solutions for cross-layer networking and computing design, providing guaranteed performance for IoT services and applications, while increasing resource utilization, reducing congestion, and improving system robustness. To solve the security challenge, I propose using the blockchain as a basic building block for establishing a secure IoT platform, and introduce how it can be extended to enable a global scale on-demand IoT marketplace. While the proposed solutions can largely address the above challenges in IoT, many of them also have applications and extensions beyond this specific context.

Bio: Ruozhou is a PhD candidate in the School of Computing, Informatics, and Decision System Engineering at Arizona State University. His research expertise lies at the intersection of cybersecurity, networking, and distributed systems. His current research interests include blockchain-based IoT, blockchain payment channels, IoT security, big data computing and analytics, etc. His work has been published on top-tier conferences and journals such as IEEE INFOCOM, IEEE JSAC and IEEE/ACM ToN. He has served as reviewers for top journals such as IEEE JSAC, TMC, TPDS, TWC, etc.

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