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Computer System Security: A Computer Architecture Perspective

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Computer systems are facing a growing threat from increasingly motivated, organized, and sophisticated attackers. The problem is complicated by the rapid evolution that computing platforms are experiencing and will continue to experience: toward mobile and embedded devices, many-core systems, virtualization, data centers, and clouds. These emerging platforms offer new system and use models, making them subject to new vulnerabilities and threat models. This talk motivates the role that computer architecture must play in the security of current and emerging systems. Dr. Abu-Ghazaleh will define this role spanning three primary directions: 1) understanding vulnerabilities exposed by the architecture; 2) architecture support for monitoring to improve resilience to attacks, as well as to rapidly detect and contain successful attacks; and 3) security for emerging architectures. He will animate these directions with examples from recent work and discuss implications for future systems.