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*Electrical & Computer Engineering*  
**S E M I N A R**  
Louisiana State University

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**Quality of Time: A New Perspective  
to Design Cyber-Physical Systems**

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**Abstract**—Unprecedented Cyber-Physical Systems (CPS) applications such as health care, connected vehicles and augmented/virtual reality are revolutionizing smart spaces. These applications span the cloud and edge devices with a critical dependence on temporal use cases. As such, cloud services are expected to provide timely responses and schedulable demands, while edge devices are required to synchronize observations and choreograph actions across distributed entities. The goal of my research is to design new systems that enable time awareness and meet consistency, causality and scheduling demands of underlying CPS applications running on commodity platforms. In particular, I design trustworthy systems centered around extensible time abstractions in the presence of timing variations and vulnerabilities.

In this talk, I will first discuss the challenges faced by time-aware applications. I will then motivate and present the necessary timing abstractions that treat time as a controllable operating system primitive while taking into account the uncertainty arising from hardware and network variations. Further, I will discuss timing vulnerabilities in trusted execution technologies and network security mechanisms; and present my design of secure global clocks. While my abstractions and system designs can be applied to many CPS applications, my talk will focus on autonomous driving use cases.

**Bio**—Fatima Anwar is a Ph.D. candidate in the Electrical & Computer Engineering department at UCLA. Her research interests lie in the intersection of system design, security, and quality of time in distributed Cyber-Physical Systems. Specifically, she designs trustworthy systems around abstractions to provide key services to the Internet of Things applications running on commodity platforms and operating systems. Earlier, she used to work at Samsung Electronics on the Smart Health project (SHealth) and developed a sensor service framework for mobile devices. She was Qualcomm Innovation Fellowship finalist in 2018 and was Anita Borg scholar in 2017. Fatima is also committed to broadening participation and volunteers for Los Angeles Computing Circle (LACC) and Engineering day for Girls at UCLA.

**When:** Thursday, 28 March 2019, 9:15 - 10:15  
**Where:** Room 3107 Patrick F. Taylor Hall  
**Info:** <https://www.lsu.edu/eng/ece/seminar>

