

EEE 598: Mobile Systems Architecture, Fall 2017

After reading this description, fill out this form to join a waitlist: <http://roblkw.com/eee598>
Direct any questions to Dr. Robert LiKamWa (likamwa@asu.edu).

Course overview

Over the past decade, smartphones, tablets, and wearable devices have dominated the personal computing market with portable interactive user experiences. However, behind the shiny interface, the mobile systems hardware and software must support sufficient computing power and energy efficiency to provision for responsive devices with sustained battery life. This course will discuss the underlying mobile systems architectures in hardware and software. By covering a mix of state-of-the-art industry trends and research papers, the course will provide a lens into the current and future state of mobile computing.

Course Topics

- Mobile Hardware Systems
 - System-on-Chip architecture
 - Embedded microarchitecture (e.g., RISC, ARM)
 - Sensor hardware
 - Mobile displays

- Mobile Operating Systems
 - Framework service architecture
 - Memory Management
 - Graphics and Media Services
 - Application support infrastructure

- Advanced Mobile Techniques
 - Cloud offload / Cyber foraging
 - Power modeling/optimization
 - Mobile security hardware/software

Prerequisites

- Object-oriented programming
- Working knowledge of C++ and/or Java language
- Familiarity with UNIX/Linux environment

Tentative Schedule (SUBJECT TO CHANGE)

Lecture Topic
Syllabus, Overview, Assignment Discussion
Mobile Systems Architecture Birds-eye
Software: Application Components I
Software: Application Components II
Hardware: ARM/RISC/System-on-Chip Architecture
Software: Android Runtime, iOS Runtime
Software: Android Runtime, iOS Runtime
Hardware: Memory architecture
Software: Memory management
Software: Framework Libraries and Services
Software: Framework Libraries and Services
Hardware: Mobile Displays
Mid-term Exam
Hardware: Mobile I/O Device Bus, Sensors
Hardware: Mobile I/O Device Bus, Sensors
Software: Mobile I/O Device Drivers
Software: Mobile I/O Sensor Processing
Hardware/Software: Power management
Hardware: Mobile GPUs
Software: Graphics and Media Services
Software: Graphics and Media Services
Hardware: Mobile Cameras and Vision
Software: Mobile Cameras and Vision
Hardware: Mobile security/privacy
Software: Mobile security/privacy
Hardware: Network Stack
Software: Cloud Offload/Cyber foraging
Last Day of Class, Recap Mobile Systems
Final Exam