Abstract:
As computing embraces heterogeneity, an increasing fraction of operating system deals with hardware directly, usually with unsafe languages like C and assembly and a primitive programming model based on registers and interrupts. This leads to a mess at the lowest level of software that is error-prone, difficult to maintain and evolve. This talk presents our recent effort in taming this mess with proper designs. We show that many of the hardware-facing functions can be moved out of device drivers and made generic, leading to much simplified hardware-specific software. Importantly we find that a little bit hardware support can go a long way toward making low-level software better structured.

Bio:
Lin Zhong is Professor of Electrical & Computer Engineering with Rice University. He received his B.S and M.S. from Tsinghua University and Ph.D. from Princeton University. He has been with Rice University since September 2005. At Rice, he leads the Efficient Computing Group to make computing, communication, and interfacing more efficient and effective. He and his students received the best paper awards from ACM MobileHCI, IEEE PerCom, and ACM MobiSys (3), and ACM ASPLOS. He is a recipient of the NSF CAREER Award, the Duncan Award from Rice University, and the RockStar Award from ACM SIGMOBILE. More information about his research can be found at http://www.recg.org.