Abstract – Many Cyber-Physical Systems are required to be of high confidence, sometimes with provable correctness. However, models and analytical results in traditional real-time scheduling theory are unable to cope with the full complexity of today's CPS. As embedded systems become more and more advanced and rich in functionalities, uncertainties in their run-time behavior, e.g., the gaps between average-case and worst-case execution times of pieces of code are becoming more significant, leading to intolerable waste of computing capacity. In this talk, I will examine the relationship between real time scheduling theory and the discipline of Cyber-Physical Systems, and report some of our recent progress in better modeling such uncertainties and analyzing schedulability in real-time CPS.

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