Real-Time scheduling under uncertainty: challenges and solutions

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Abstract: After a brief summary of the literature on real-time scheduling and scheduling analysis for hard real-time systems, I will present the challenges posed by modern architectures and modern applications. In particular, the use of sophisticated COTS processor leads to unpredictable execution times of concurrent tasks. Therefore, critical real-time systems must cope with uncertainty. Modern real-time systems must be design with robustness adaptivity in mind: they must be able to detect anomalies in the temporal behaviour and react accordingly. I will highlight some of the techniques that can be used to alleviate the problem: from timing isolation of components, to soft-real-time scheduling techniques, to fault-tolerant techniques.

Short Biography: Giuseppe Lipari is Professor of Computer Science at University of Lille. He is member of the Embedded Real-Time Adaptative system Design and Execution (Emeraude) team of the Centre de Recherche en Informatique, Signal et Automatique (CRIStAL) de Lille. He associate editor of IEEE Transactions on Computers, associate editor of the Journal of System Architecture, and associate editor of the Real-Time Systems Journal. His research interests are in real-time systems, real-time operating systems, scheduling algorithms, embedded systems, wireless sensor networks. He is IEEE Fellow for his contributions to reservation-based real-time scheduling.