Abstract

Real time systems have been a major area of study for many years. Advancements in electronics, computers, information technology and digital networks are fueling major changes in the area of real time systems. In this thesis, we look at some of the most commonly modeled real time task systems, such as the periodic task model, including more complex task models such as the sporadic task systems. Primary focus of researchers in these fields include how to guarantee hard real time requirement of any task specification, with the minimal utilization of available hardware resources. Advancement in technology has brought multi-cored architectures with shared memory and massively parallel computing devices within the reach of ordinary computer users. Hence, it makes sense to study existing and newer task models on a wide variety of hardware platforms.

Periodic task model and systems with such task models have been designed and well understood. Newer models such as the sporadic task models have been proposed to capture a more larger variety of real time systems being designed and used. We focus on designing more efficient scheduling algorithms for the sporadic LL task model, and propose simpler proofs to some of the algorithms existing in current literature. This thesis also focuses on scheduling sporadic task systems, under both multiprocessor full-migration and multiprocessor partitioned scheme. We also provide approximation algorithms to efficiently determine feasibility of such task systems.