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Title: Multi-Core Time-Triggered OCBP-Based Scheduling for Mixed Criticality Periodic Task Systems

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Abstract: Mixed criticality systems are one of the relatively new directions of development for the classical real-time systems. As the real-time embedded systems become more and more complex, incorporating different tasks with different criticality levels, the continuous development of mixed criticality systems is only natural. These systems have practically entered every field where embedded systems are present: avionics, automotive, medical systems, wearable devices, home automation, industry and even the Internet of Things. While scheduling techniques have already been proposed in the literature for different types of mixed criticality systems, the number of papers addressing multiprocessor platforms running in a time-triggered mixed criticality environment is relatively low. These algorithms are easier to certify due to their complete determinism and isolation between components of different criticalities. Our research has centered on the problem of real-time scheduling on multiprocessor platforms for periodic tasks in a time-triggered mixed criticality environment. A partitioned, non-preemptive, table-driven scheduling algorithm was proposed, called Partitioned Time-Triggered Own Criticality Based Priority, based on a uniprocessor mixed criticality method. Furthermore, an analysis of the scheduling algorithm is provided in terms of success ratio by comparing it against an event-driven and a time-triggered method.

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