Abstract

The intelligent real-time system design needs to incorporate autonomic features in their operations to achieve the unexpected criticalities of systems and its environment. Catastrophic scenarios can emerge in systems, challenging the traditional role of real-time systems where the temporal rigidity is the essential design feature. The priorities and its management scheme given for a normal operation by the conventional real-time systems need not be the ultimate format to meet the requirements of a catastrophic environment. Hence, usual real-time system is supplemented with a layer of intelligence to deal with the emerging catastrophic environment. Intelligent real-time systems can have hybrid schedulers with some additional features that can guarantee risk mitigation performance even with the occurrence of extreme, unusual variations of external conditions. This approach addresses intelligence in systems by making a real-time system schedule itself to adapt meaningfully even if the environment changes, by assigning intelligent priorities. This paper introduces the design of Intelligent Real-Time System (IRTS) that keep shifting the boundaries of the original hybrid scheduler with cognitive features aiding the intelligence by increasing the possibility to make a dynamically reconfigured system while
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increasing the fairness of the scheduling. Intelligent scheduler can be used in embedded critical systems in order to cope with the unexpected problems like nuclear power plants and hazardous installations. Theoretical analysis shows that the proposed design performs the operation of IRTS, which can be advantageously applied to pragmatic systems and show how intelligence works with priority.

References


Index Terms

Computer Science    Embedded Systems

Keywords

Real-time system, catastrophe, intelligent, cognitive, priority