

METHOD FOR THE REAL-TIME ORDERING OF A SET OF NON-CYCLICAL MULTI-FRAME TASKS

The subject of the present invention is a method for the real-time scheduling of multi-frame software tasks. It relates to the field of real-time processors, for example signal processing processors, on which a plurality of functions, also called software tasks, are run, which may be concurrent, that is to say be invoked simultaneously. The invention relates more particularly to the issue of the real-time scheduling of the software tasks executed by one or more software applications on one or more parallel processors.

A multi-frame task is a task or software function which executes a processing operation on a plurality of data frames with which are associated an execution time, a deadline and a guard time with respect to the next frame. The execution time C is the time needed to execute, on said data frame, the functional processing operation defined by the corresponding task on a given processor. It depends both on the complexity of the processing operation to be executed and on the resources of the processor, notably its operating frequency. The deadline D corresponds to the relative time which elapses between the activation of a task and the time at the end of which the execution of this task must be finalized. The deadline depends notably on time constraints linked to the software application or to the system implemented which uses this application. The guard time P corresponds to the minimum time which elapses between two successive calls to a same task.

One of the problems that the invention seeks to resolve is to guarantee the real-time feasibility of the implementation of a set of multi-frame tasks, which together define an application or a system, having given execution time, deadline and guard time parameters on a given processor. To this end, the technical problem to be resolved relates to the real-time scheduling of these tasks on this processor. In order to guarantee that the