Reduction to Uniprocessor Algorithm with Exploitation of Idle Times through Bayesian Networks

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RUN

$t_{ini}$

$\tau' \in \tau^{RUN}$

WCET
Worst Case Execution Time

$t_{current}$

$t$
Problem

The execution time of every task $\tau' \in \tau^{\text{RUN}}$ has a stochastic behavior. It is assumed that the tasks in $\tau^{\text{RUN}}$ are executed in less time than their respective WCETs.

$t_{\text{current}}$
Problem

\[ \tau' \in \tau^{\text{RUN}} \]

It is not possible...

Fixed values
Problem

\( \tau' \in \tau^{\text{RUN}} \)

Idle time
Approached solution (1/4)

• Take advantage of the idle times by means of adding an extra set of tasks, be \( \tau \). This extra set is disjoint to \( \tau^{\text{RUN}} \).

\( \Rightarrow \) \( \tau \) is conformed by two types of tasks:

1. Tasks conformed by *just one job*
2. Tasks of type *job-shop*
Approached solution (2/4)
Approached solution (3/4)
Approached solution (4/4)

∀ \tau_i, j \in \tau has an execution time with stochastic behavior

\[ t_{\text{ini}} \leq t \leq t_{\text{current}} \]

\[ \tau' \in \tau^{\text{RUN}} \]

\[ \tau_i, j \in \tau \]
An interruption is thrown every time a task finishes its respective WCET.
Bayesian inference

\[ \tau' \in \tau^{RUN} \]

\[ \tau_{i,j} \in \tau \]
Bibliography
