

Scheduling on unreliable machines

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Abstract

We consider a machine scheduling setting where machines can fail "almost online", i.e. the next point in time where availability changes is revealed. We consider a heuristic MIMIC that makes strong use of offline approximations.

We show that MIMIC loses only a factor of $1/(1-f)$ over the offline solution for all completion time based objectives if machines fail with probability f , even in the presence of precedence constraints and release dates.

We show that MIMIC is a generalization of the Lookahead algorithm of Albers and Schmidt, hence, it is optimal for the makespan objective and discuss problems that arise when extending MIMIC to non-identical machines.