Scheduling of Multi-stage Batch Processes Using Dynamic Decomposition on a Grid

- Computer manufacturers focus on multi-core architectures; computational resources become cheap
- Algorithms that utilize new architectures or exploit parallelization necessary
- Batching/scheduling problems have hierarchy of decisions
  - Selection of tasks ⇒ Unit-task assignments ⇒ Task sequencing
- Exploit hierarchy to generate subproblems spawned to workstations
- Hard subproblems are dynamically decomposed
- Successful implementation using grid computing

Master computer: Problem decomposition

Workers: Solution of subproblems
Solutions/bounds collected by master

Master collects unsolved problems;
2nd-level decomposition

Process repeated as necessary

Task selection
Unit-task assignment
Task sequencing
Strong branching