Parallel Global Optimization of ABB's ADM using Matlab

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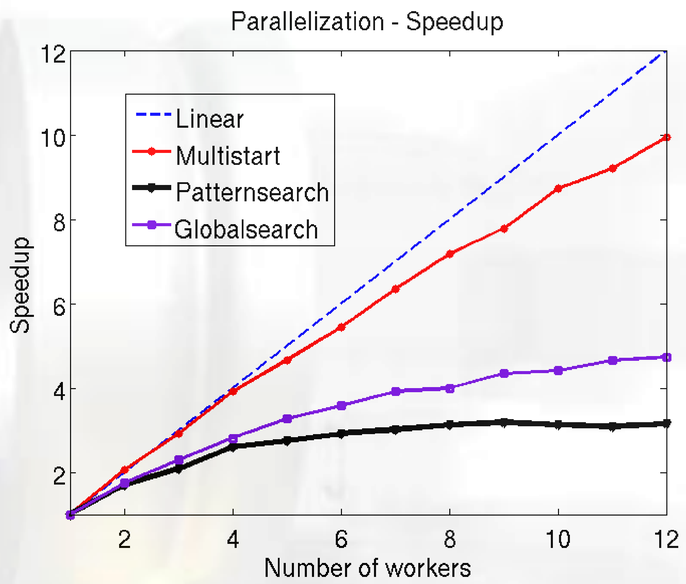
ADM

The **A**daptive **D**imension **M**odel is an optimization tool used in industrial Hot Rolling, a type of metalworking process. It minimizes energy consumption, maximizes material strength etc.

ADM finds a local minimum of a constrained nonlinear optimization problem.

Goal

We want to extend the ADM to use global solvers in parallel and identify solvers which are accurate and fast.



Global Solver	Accuracy	Parallel
Multistart	+++	+++
GlobalSearch	+++	++
Patternsearch	-	+

Method

We implement global solvers: *Multistart*, *Globalsearch* and *Patternsearch* in Matlab.

For each solver we identify parameters that result in high accuracy, i.e. consistently finding the global optimum. Finally we implement parallelization and analyze speedup.

Conclusion

Multistart outperforms the other solvers. This result could be used in a future cloud/cluster application.