

**June 2011**

**MADALGO seminars by Alejandro López-Ortiz, University of Waterloo**

**Efficient scheduling of equal size tasks in multiple machines**

**Abstract:**

Consider the problem of scheduling a set of tasks of length  $p$  without preemption on  $m$  identical machines with given release and deadline times. We introduce a novel graph representation of this task as a "scheduling graph" and show that there exists a feasible schedule if and only if a certain graph property holds. We then propose a compact representation of the graph and auxiliary data structures to test for said property leading to an algorithm has time complexity  $O(\min(1, p/m) * n^2)$ .

This improves substantially over the best previously known algorithm with complexity  $O(m * n^2)$ . Interestingly the algorithm produces a schedule which minimizes both completion time and makespan.

**Joint work with Claude-Guy Quimper**