

## Heterogeneous computing for the surgery scheduling problem

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The generalized surgery scheduling problem can be modeled as a rich extension to the resource constrained project scheduling problem. We formulate such a model as an extended disjunctive graph model. Our aim is to design an efficient local search algorithm that - through its application to this general problem model - is robust across most practical variants of the surgery scheduling problem. Such an algorithm must be able to modify the solution graph in an efficient manner, taking advantage of the graph properties to achieve efficient selection of “insertion cuts”, criteria evaluation and selection of independent moves. In this talk we focus on the surgery admission problem, which is a simplification of the general problem in that it only considers one activity per project, and typically only two types of resources (e.g. surgeons and operating rooms) for each activity. Resource availability can be formulated on a per day basis, which drastically reduces the effort of propagating time in the solution graph following modifications. We describe the overall algorithm, and discuss how a heterogeneous architecture can be exploited in a flexible manner to solve the various steps, including the selection of “resource period cuts” and “insertion cuts”, as well as move evaluation and selection of independent moves.