On Multi-Robot Path Planning based on Petri Net Models and LTL Specifications

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This paper proposes a method exploiting the advantages of Petri net (PN) and B¨uchi automata models, by joining them in a newly defined Composed Petri net representation. Based on the latter model, collision-free trajectories are computed for a team of robots. The path planning algorithm is divided into two steps: computing a solution in a reduced PN model, and projecting it to the PN assigned to the environment. The results, given by a set of Mixed Integer Linear Programming (MILP) problems, yield lower computational complexity when compared with previous approaches.