



DISTRIBUTED MULTI-ROBOT ASSEMBLY/PACKAGING ALGORITHMS

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ABSTRACT—Five different algorithms for cooperation between assembly/packaging robots in a distributed system were developed and evaluated in simulation. Independent, autonomous operation of each robot was assumed. The goal was to maximize the number of assemblies while minimizing the standard deviation of the work between the different robots. Two of the algorithms, a *fuzzy* algorithm and a *simple* “take-what-you-can” algorithm were implemented on an experimental system. Experimental results indicated better performance for the *simple* algorithm in terms of the number of assemblies. However, the *fuzzy* algorithm reduces the standard deviation of work between the robots and therefore equalizes the robots’ utilization. Equal utilization is a major factor in multi-robots systems, and contributes in decreasing mean time between failure (MTBF).

Key Words: Multi-robots, fuzzy logic, behavior-based, assembly

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