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Performance of Critical Path Type Algorithms with Communication Delay

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Abstract—The Brucker-Garey-Johnson algorithm and Hu's algorithm are based on the idea of the critical path method and were developed for the model with unit execution time tasks, precedence constraints and parallel identical processors. The performance guarantees for these algorithms have been presented in Singh and Zinder (2000a, 2000b). We present upper bounds for the Brucker-Garey-Johnson algorithm with communication delays, which can be seen as a generalization of the performance guarantees in Singh and Zinder (2000a, 2000b). As a particular case this also gives performance guarantees for Hu's algorithm with communication delays and therefore, also generalizes the previously known performance guarantees for this algorithm.

Keywords—Scheduling theory, Unit execution and communication times, Precedence, Maximum lateness, Worst-case analysis

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