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**Distributed Job Reliability Analysis  
Using  
Fuzzy Sets**

**A Thesis**

**Presented to the**

**Faculty of the Graduate Program  
of the College of Computer Studies  
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## Abstract

Reliability of distributed systems can be examined in terms of the reliability of the processing elements and communication links and also of the redundancy of jobs and data files. The traditional terminal pair reliability does not capture the redundancy of jobs and data files in a distributed system. This study will focus on the evaluation of distributed job reliability using fuzzy sets. Distributed job reliability (DJR) is the probability that a given job can run successfully in spite of some failures occurring among the processing elements and the communication links.

A conceptual model with algorithms for computing the reliability of a distributed job will be presented. The algorithms generate shortest resource subgraphs (RRSs) which satisfy the distributed job execution cost constraint. This constraint will limit the number of shortest resource subgraphs.

This paper presents a graph theoretic model that is used in formal analysis. This study will focus on evaluating distributed job reliability using the fuzzy set theory approach. Formal proof of correctness of algorithms is conducted.



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