URN etd-0407109-183719-1539
Author Jane-Yi Lee
Author's Email Address No Public.
Statistics This thesis had been viewed 35 times. Download 19 times.
Department
Year 2004
Semester 1
Degree Master
Type of Document Master's Thesis
Language zh-TW.Big5 Chinese
Title Time Analysis of Project Networks with Fuzzy Durations
Date of Defense 0000-00-00
Page Count 65

Keyword Keyword:
PERT; Fuzzy number; Possibility theory; Extension principle; Fuzzy arithmetic; Parametric analysis

Abstract
In this study, we consider the time analysis and activity criticality analysis of a project network with fuzzy durations. At first, we propose two methods for the time analysis, one based on fuzzy arithmetic and the other based on parametric analysis. Then, we give some notes on the evaluation of slack times and the activity criticality analysis. In the literature, many authors modify the forward pass and the backward pass for the crisp PERT to solved the case with fuzzy durations. In these methods, the operations used for the crisp PERT (addition, subtraction, maximum, and minimum) are replaced with the corresponding fuzzy operations. But, since the fuzzy subtraction is not the inverse operation of fuzzy addition (or more precisely, the inverse of a fuzzy number under fuzzy addition does not necessarily exist), an anomaly arises in the backward pass. In our method based on fuzzy arithmetic, we solve a simple fuzzy equation instead of using fuzzy subtraction. In additions, many authors use a fuzzy ranking function to find the maximum and the minimum of two fuzzy numbers. Although, this approach can reduce the computational complexity and the phenomenon of time expansion, the solution is not natural and the estimates of earliest times and latest times are not correct. According to the possibility theory, using the operations that extend the crisp maximum and the crisp minimum operations under Zadeh's extension principle is more proper. In our method based on parametric analysis, we show how can we use Lin and Chern's (1993b) fuzzy linear programming method to solve the time analysis of fuzzy PERT. From the results of numerical example, we find that the methods proposed in this study get the same solution. The reason may be that both of the proposed methods use only Zadeh's extension principle without any heuristic. The advantage of using only Zadeh's extension principle without any heuristic is the support from the possibility theory. In the end, we give some notes on the evaluation of slack times and the activity criticality analysis.
Advisory Committee Kao-Cheng Lin - advisor

Files etd-0407109-183719-1539-001.pdf

indicate access worldwide
Date of Submission 0000-00-00