International Journal of Innovative
Computing, Information and Control
Volume **7**, Number **1**, January **2011**

ICIC International ©2011 ISSN 1349-4198
pp. **237–252**

# APPLICATION OF SIGNED DISTANCES METHOD TO INTEGRATE LINEAR PROGRAMMING FOR FUZZY MULTI-OBJECTIVE PROJECT MANAGEMENT

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Received August 2009; revised May 2010

Abstract. *The belief that the project manager, a person in charge of the project management (PM), plays a very important role to handle conflicting goals with the usage of all resources through the organization is without doubt. The main purpose of the project management is to minimize total project and crashing cost with the reference to both direct and indirect cost and other related constraints simultaneously. This work focuses on the application of fuzzy sets to solve fuzzy multi-objective PM decision problem with the consideration of its completion time in a suitable range; and it will present an interactive solution procedure to determine the preferred compromise solution for the multi-objective PM decision problem. The proposed approach considers the imprecise nature of the input data by implementing the minimum operator and also assumes that each objective function has a fuzzy goal. And this approach focuses on minimizing the worst upper bound to obtain an efficient solution which is close to the best lower bound of each objective function. For attaining our objective, a detailed numerical example is presented to illustrate the feasibility of applying the proposed approach to actual PM decision problem at the end of this paper. Furthermore, we believe that this approach can be applied to solve other multi-objective decision making problems.*

**Keywords:** Project management, Fuzzy set, Fuzzy multi-objective linear programming

1. **Introduction.** Recently, both practitioners and academicians have been more interested in finding better project management decisions of complex possible problems. Numerous mathematical programming techniques and heuristics with considering fuzzy theory have been developed for solving PM problems, each with its own advantages and disadvantages. Okuhara, Shibata and Ishii [1] utilized genetic algorithm to the adaptive assignment of worker and workload control in PM decision problems. Lin [2] utilized statistical confidence-interval estimates and level (1-$\alpha$) fuzzy numbers to solve project time-cost tradeoff problems. Arikan and Gungor [3] utilized fuzzy goal programming (FGP) approach to solve PM decision problems with to solve PM decision problems with two objectives – minimizing both completion time and crashing cost. Additional work, like Wang and Fu's work, applied fuzzy mathematical programming to solve PM decision problems [4]. These models aim to minimize total project cost and total crashing cost simultaneously. Liu [5,6] addressed a new evolutionary algorithm (EA) to solve multi-objective constrained optimization problem (MCOP). Wang and Liang [7] developed an