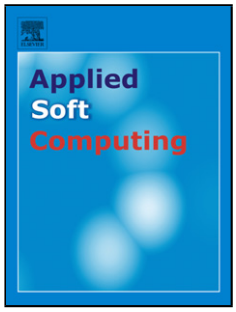


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# Adaptive linguistic weighted aggregation operators for multi-criteria decision making

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## Highlights

- **New aggregation operators for linguistic settings.**
- **Properties of the proposed operators.**
- **Explaining choice behaviour based on aggregation.**
- **Applications in real world decision making.**
- **Empirical validation of the proposed operators.**

***Abstract***

***In this paper, we propose new aggregation operators for multi-criteria decision making under linguistic settings. The proposed operators are based on two sets of criteria weights. Besides the primary conventional criteria weights, we introduce a method to deduce secondary criteria weights from the criteria evaluations, which reflect the role of the different criteria in discriminating among the alternatives. The properties of the proposed operators are investigated. An approach for the application of the said operators in a group multi-criteria decision making problem is presented. Following the same, the proposed operators are applied in a case study on supplier selection. The empirical validation of the proposed operators is performed on a set of 12 real datasets.***

***Indexing Terms: multi-criteria; decision making; linguistic evaluation; aggregation operator; supplier selection***

## 1. INTRODUCTION

Several studies have been made in the recent times in the area of multi-criteria decision making (MCDM) under uncertainty [1-6]. In these studies, experts give an evaluation of suppliers against the various criteria in terms of fuzzy membership values [1-4] or intuitionistic fuzzy membership values [5-6], followed by the aggregation of information (regarding evaluation and weights) and the ranking of the alternatives. In the real world, it may be quite a complicated task for the experts to arrive at the membership values objectively. The