A Revised Model of Fuzzy Extended AHP

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Abstract

Fuzzy Extended Analytic Hierarchy Process (FEAHP) was first developed by Chang (1996).
FEAHP is an efficient tool to deal with fuzziness of the decision variables in the process of
deciding the preferences.
However, Zhu, Jing and Chang (1999) pointed out that FEAHP was imperfect when two
triangular fuzzy sets did not intersect. They proposed that when two triangular fuzzy numbers
did not intersect, $\mu(d)$ should equal zero, and that the criteria/alternatives (of the model) would
be eliminated, rendering the model irrelevant. Wang, Luo and Hua (2008) mentioned that
because of the elimination of the criteria/alternatives, FEAHP may lead to a wrong decision,
while useful decision information might not been considered.
In this paper, a revised model of FEAHP which can be operated without eliminating any
criteria/alternatives is proposed. Therefore, this revised model of FEAHP becomes more
effective in estimating the importance of decision criteria/alternatives. Two examples are given
to demonstrate the calculation processes, and the results, of the revised FEAHP model

Keyword：fuzzy extended analytic hierarchy process; pairwise comparison; membership function