# UNIVERSITI TEKNOLOGI MARA

# HYBRID GROUP DECISION MAKING METHOD BASED ON MULTI-GRANULAR INFORMATION USING FUSION ALGORITHMS AND CONSISTENT FUZZY PREFERENCE RELATION

# SITIAMNAH BINTI MOHD RIDZUAN

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### ABSTRACT

Decision making is a process of choosing the best alternatives from available options. A group decision making involves the evaluation of alternatives or criteria from multiexpert preferences. Each decision makers have their own knowledge and opinion to make an assessment. This will increase the complexity in computation. Two new decision making models have been developed in this study, the first is the combination of multi-granular linguistic information using fusion algorithm and consistent fuzzy preference relations (CFPR) and the second one is the combination of multi-granular uncertain linguistic information and consistent linguistic fuzzy preference relations (CLFPR) to cater this problem. These proposed methods are able to evaluate the alternatives or criteria based on the different opinion with different assessment measurement and also able to minimize the number of pair-wise comparisons when the number of criteria increase. Fusion approach is utilized in order to manage multigranular linguistic information involved in the consistent fuzzy preference relations (CFPR). The multi-granular linguistic information will be aggregated into CFPR values and the final ranking of the alternatives can be determined efficiently. While for multigranular uncertain linguistic information, the evaluation will be aggregated into CLFPR values and the final preference of the alternative will be determined using a method of ranking fuzzy numbers. Both algorithm been illustrated in textbook selection. The proposed methods can be utilized as another option to solve a decision making problem.

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# IN THE NAME OF ALLAH, (AL MIGHTY) THE MOST GRACIOUS, THE MOST MERCIFUL

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