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A BINARY LOGARITHM SIMILARITY MEASURE WITH ROUGHNESS APPROXIMATION OF ROUGH NEUTROSOPHIC SET FOR COVID 19 CASES

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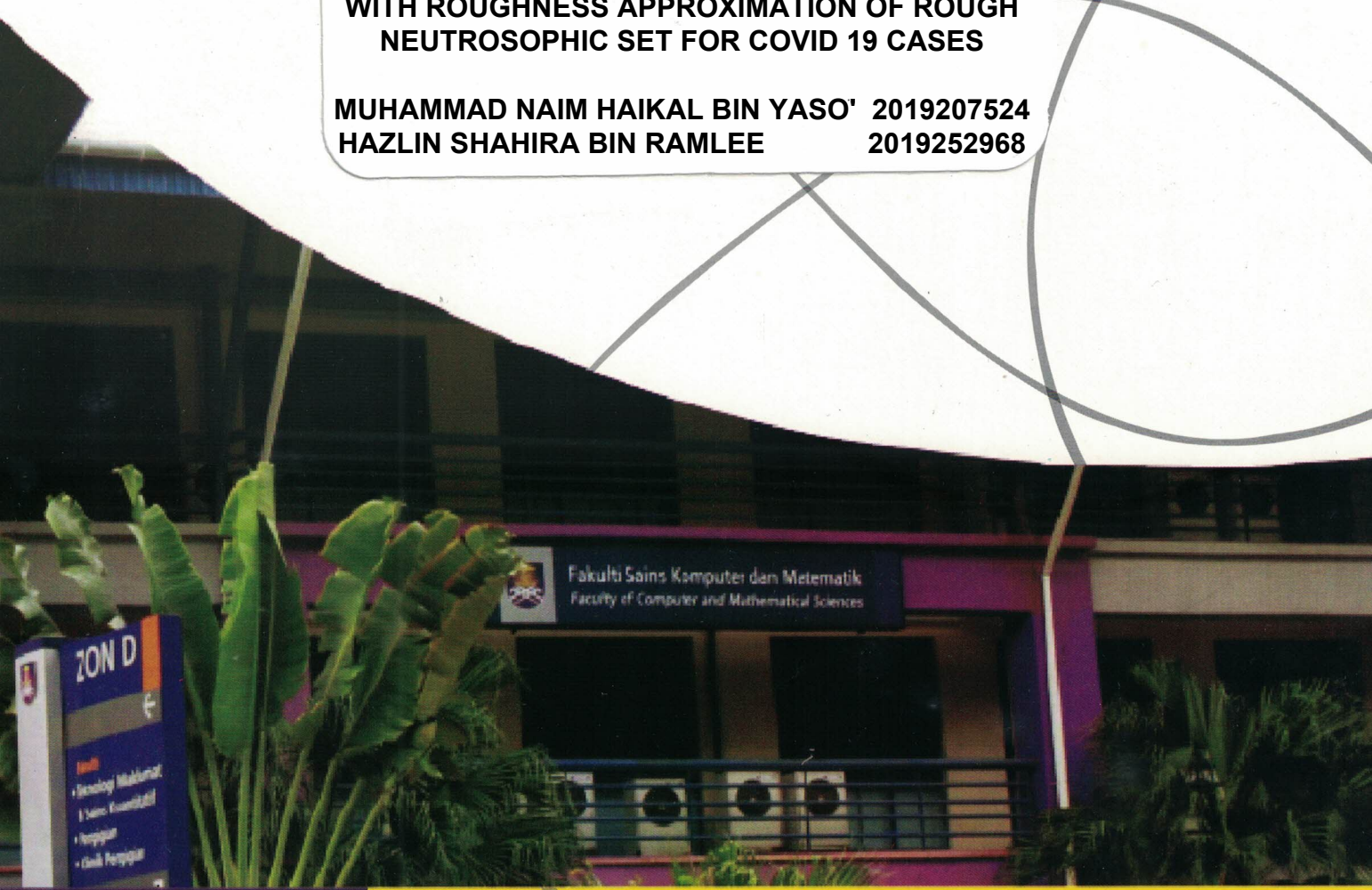

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ABSTRACT

The findings of the similarity measure between two or more expert-provided information are categorized as either a strong or a weak relationship. As a result, getting the results for the similarity measure as the best conclusion for the information relationship is important. Based on the previous studies, the binary logarithm similarity measure was chosen as the similarity measure approach in this study. In addition, a rough neutrosophic set was chosen as the uncertainty set theory information, which includes the upper and lower approximation with a boundary set was chosen as the set theory application. The objectives of this study are to define binary logarithm similarity measure for rough neutrosophic sets, to formulate the properties satisfied the binary logarithm similarity measure of rough and to develop a decision-making model by using a binary logarithm similarity measure for case study (COVID 19). The roughness approximation is used in the definition of the binary logarithm similarity measures. Following that, the derivation algorithm for identifying the most important priority group for COVID 19 vaccine is presented. The roughness approximation for a rough neutrosophic set is used to compare the similarity results. The proving result is finalised. Then, the derivation of binary logarithm similarity measures of rough neutrosophic set is well defined. As a validation process, the similarity properties for identifying the most important priority group for COVID 19 vaccine used such as age, health state, women and job kinds. Finally, if either value of the similarity measure is close to one, a strong relationship between the information given or vice versa is defined.

1 INTRODUCTION

1.1 Research Background

Artificial intelligence and cognitive sciences have recently focused their attention on a variety of decision-making problems. Yasser et al. (2020) mentioned medical diagnosis is known as one of the most difficult decision-making problems since it is one of the main application areas that requires accurate and real-time results. Samuel & Narmadhagnanam (2019) stated that, it is a method for examining the association between symptoms and diseases based on data. As a result, several mathematical methods have been developed in recent decades in order to solve all these difficult decision-making problems. Fuzzy set (FS) theory introduced by Zadeh (1965). This theory has had a lot of success in real-world applications for dealing with the uncertainty. Many generalization of FS have been proposed since its development including intuitionistic fuzzy sets (IFS) introduced by Atanassov (1986) and bipolar fuzzy sets (BFS) introduced by Lee (2000). After that, many other new theories emerged, including rough sets (RS), soft sets (SS), and neutrosophic sets (NS). Smarandache (1998) proposed the theory of NS. Since its existence, NS has been used in a variety of real-world applications, including pattern recognition, picture segmentation, and processing, among others. It helps to solve a variety of academic and practical real-world challenges in a variety of fields, medical, economics, space satellites, and more. Rough neutrosophic set (RNS) existed as a generalization of RS and single valued neutrosophic set (SVNS). RNS was presented by Broumi et al. (2014). The RNS theory is useful technique for dealing with incompleteness in mathematics. A mixed set structure has the advantage of being more efficient than a computation method that just considers one variable. Combining two or more constructions will produce the best outcomes for more than employing one construction only. Combining approaches produces better results in some circumstances.