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**DEVELOPMENT OF A SOFTWARE INFRASTRUCTURE  
FOR  
A FUZZY LOGIC BASED DECISION SUPPORT SYSTEM  
FOR CRITICAL CARE**

A PROJECT REPORT PRESENTED BY

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to the Board of Study in Computer Science  
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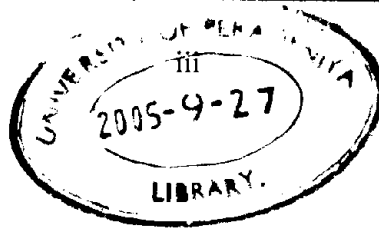
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A study was undertaken to develop a Fuzzy Expert shell, for the purpose of developing a Decision Support System to assist diagnosis in Critical care, at the Faculty of Medicine, University of Peradeniya. This study was undertaken after the first attempt made to develop a decision support system using two statistical quantities sensitivity and specificity. Although the initial system was capable of providing a satisfactorily ranked diagnosis, it was felt that the decision algorithm can be improved by taking into account the vagueness of the complaints made by the patient and the observations made by the doctor.

Hence in this study it was investigated as how to express these vague statements and observations (clinical features) using fuzzy set theory. The decision algorithm used was fuzzy logic. Once the fuzzy inputs are given in this case various clinical features related to the patient, these inputs are associated to various diseases not in true crisp logic, but in an intuitive manner. The output of the system is expressed with a degree of fuzziness, which is a ranked diagnosis.

Major objective of the this phase of the project was to develop a software environment or a fuzzy expert shell, to facilitate the development of expert knowledge base with ease as well as for assisting the doctor in diagnosis. Special emphasis was given to ergonomic aspects of the user interfaces to provide a user

friendly environment for the medical experts to input expert knowledge such as input and output membership functions and rules to the knowledge base as well as for the doctor to use it with ease while inspecting the patient, which can otherwise be a burden than a help.

The developed system was validated using a set of bench mark data and results were compared with that of manual processing. All possible conditions were included in the input and output membership functions as well as in set of rules. System was found to produce the desired output compared with the manual output. However the validation of the system is needed with the development of the expert knowledge data base.