

ABSTRACT

An expert system has been widely used for solving many problems including diagnosing disease. This research discusses the development of the expert system for detecting the lungs' disease such as Tuberculosis. The knowledge base is represented as rule-based on an expert system that contains rules for inferring the solution. The expert system uses forward chaining method for solving inferring the disease based on the rules. In addition, Uncertainty management method namely certainty factor is used by the system for detecting the diseases because there are so many uncertain factors in diagnosing diseases.

This research also discusses the application of the genetic algorithm. A genetic algorithm has been used in many varieties of fields and solves the problems of the optimization. In this research, optimizing the patent drugs purchase based on the users' budget and the needed generic medicines for the diseases are the aims of the genetic algorithm. Moreover, the encoding of the algorithm is integer encoding and the selection method is roulette wheel selection. Therefore, the method of crossover and mutation are selected to fit in the integer encoding. Finally, the method for updating the generation is steady update method. Iteration of the genetic algorithm is set by the users and the algorithm stops after the maximum iteration or the patent drugs' price which is lower than user's budget has been found.

The expert system is tested based on the 50 data of the patients and 20 data from the doctor's input. The experiment result of 50 data from the patients shows that 98 percent of accuracy in diagnosing the diseases. Meanwhile, 20 data which is from doctor's input shows that the result is 100 percent. In other hand, to test the genetic algorithm part when optimizing the patent drugs' purchase, the 50 patients' data are used and the result shows that 98 percent of the data has the minimum price suggested below the budget of the patients.

Keywords: Expert system, Certainty factor, Genetic algorithm, Pulmonary disease