An Analytical Survey on Life Expectancy Prediction of Liver Transplantation

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Abstract— Due to increase of Technology in Medical science there is a significant growth is seeing in organ transplantation. Most of the times receiver's life span can be predict based on his /her health conditions. But this may not be true in case of Liver transplantation; this is mainly due to complicated working structure of liver and its unexplainable importance in functioning of human body. More often the predicted life span of the liver transplant receiver end quite early. So, to predict the life span of reciever data mining can be a advantage. So, propose model uses hidden markov model as a learning process which is powered with Dempster–Shafer reasoning.

Key words: HMM, DSR, Survival Prediction, Survival Probability, Fuzzy Classification

I. INTRODUCTION

In todays era it is believed that liver transplantation is a treatment specially for acute and dire final-stage liver disease, Despite the expensive nature in this surgery, many patients opt for this surgery because of the evolution in technology that achieved a better survival rate. This survival rate depends on many factors graft quality, the condition of the patient, availablity of donor.

Liver illness evils the liver and keeps from its functioning. Liver disease incorporates hepatitis, growth of the liver, diseases, medicines and so on. Transplantation of Liver is a powerful treatment for last stage liver malady and liver disappointment. Liver is an extensive indispensable organ that discovered just in vertebrates in human it lives in the upper rightside of the midriff and beneath the stomach

This software requirements specification provides a complete description of all the functions and constraints of the "Long-Term Forecasting the Survival in Liver Transplantation Using Hidden Markov Model". The document describes the issues related to the system and what actions are to be performed by the development team in order to come up with a better solution.

II. LITERATURE SURVEY

1) In this paper, Naveen.T and Suvendu.K described a method to find initial centroids with the use of an entropy-based far from neighbour. The K-means is used to effectively analyze the data by co`mparing sample profiles. The algorithm used in this paper is a variant method of using a k means for finding best initial centroids. Thus this approach of clustering shows the accuracy of gene clusters having less number of iterations which was not available in traditional k-means
2) Mahmut.E.C and Ebrahim.B studied the neural activity process of the retinal ganglion for characterization.They found that current implantable retinal implants generate large data which should provide strong neural signals. For this purpose, the algorithms like spike sorting and k-means are used.When detected Spike activity using the activity from the experiment records, later the recorded data is sorted and pre-processed using k- means to distinguish spikes. According to neural activity is efficient and sorted approach is developed.
3) In this paper, Eslam.N.D , Amr.B, and Abdel.F.H attempt to improve the stock market prediction framework by implementing a new model. It was found that previous experiments in this field were not accurate and did not achieve results which is significant. thus cluster algorithms were developed by combining k-means and genetic algorithm . These algorithms is further used for optimization of the clustering in stock market prediction.
4) In the following paper, Gandhi.M and Prof.Bijal .T have proposed a neural approach and segmentation method to improving medical images accuracy using ANN. The segmentation of medical image is an essential and initial step in medical image processing. The authors have proposed an ANN for the choice of segmentation method where an evaluation of the quality of segmentation by different methods is carried out. Later based on some objective parameters the characterization of images is performed. Thus RBF ANN csn give better results.
5) Nunes dos.S, Tiago.P.V, Eckhard.S, Uwe.H, Rigoberto.E.M.M and Marco Jose´ da.S proposed an reconstructing image approach for optical tomography, In this a layered back-propagation of the neural network is used. with the use of Levenberg-Marquardt algorithm the two-dimensional images of two-phase gas-liquid flow is done by reconstruction. The ANN understands relation between the optical tomography projections and reference sensor. Thus neural network approach retrives reconstructed images with preserving good details of data
6) In this paper, Anwar.A.K, Mohammad.S.J and Shama.S presented a simple asynchronous MAC scheme for the wirelesssensor network. Efficient management of duty-cycle in wireless sensor network im-proves the MAC protocols. to predict the data arrival instants in order to achieve dynamic duty cycles they use ANN. significant improvement has revealed by using this scheme in terms of energy and delay as compared to traditional techniques.
7) Tekenori.Y, Keeiichiro.O, and Kei.H proposed a method to build multiple decision trees as a structure of factoranalyzed (HMM)hidden Markov model for speech synthesis. In this method, the multiple decision trees grow simultaneously rather than sequentially to take into account relation between the trees. Further to achieve significant reduction in the computational time two computational complexity reduction algorithms are proposed. thus the results show that the proposed method

outperforms the conventional one based on a single decision tree.

III. TECHNICAL KEYWORD

A. Baum-Welch Algorithm

The Baum–Welch algorithm calculates the parameters of HMMs in noisy information or deciphering hidden and consequently is used in crypt-analysis. In data security to extract data from a data stream without being aware of any parameters of transmission. This can involve a channel encoder. HMMs and as a consequence the Baum–Welch algorithm have also been used to identify spoken phrases in encrypted VoIP calls. In addition HMM cryptanalysis is an important tool for automated investigations of cache-timing data. It allows for the automatic discovery of critical algorithm state, for example key values.

B. Dempster Shafer Reasoning

The theory of belief functions, also referred to as evidence theory or Dempster Shafer theory (DST), is a general framework for reasoning with uncertainty, with understood connections to other frameworks such as probability, possibility and imprecise probability theories. First introduced by Arthur P. Dempster in the context of statistical inference, the theory was later developed by Glenn Shafer into a general framework for modeling epistemic uncertainty—a mathematical theory of evidence. The theory allows one to combine evidence from different sources and arrive at a degree of belief (represented by a mathematical object called belief function) that takes into account all the available evidence

In a narrow sense, the term Dempster–Shafer theory refers to the original conception of the theory by Dempster and Shafer. However, it is more common to use the term in the wider sense of the same general approach, as adapted to specific kinds of situations. In particular, many authors have proposed different rules for combining evidence, often with a view to handling conflicts in evidence better. The early contributions have also been the starting points of many important developments, including the transferable belief model and the theory of hints.

IV. EXISTING SYSTEM

The whole data set was divided into training and test tests with ten-fold cross validation and applied to an MLP model. By applying random sampling, the data set was given a 75–25 % pattern format. Our data set consisted of a total of 383 instances, out of which 287 were assigned to the training set and 96 to the test set, as shown in Table 3. We used attribute representation with numbers and percentages for nominal attributes and mean/standard deviation for numerical attributes. For example, in the case of BMI, the mean is 27.29 in the model set and 28.38 in the validation set, with a standard deviation of 5.93 in the model set and 9.41 in the validation set. All the clinical data were passed on input to the MLP model. The model classifies the data and finds appropriate donor-recipient matching pairs using WEKA software. The result produced was shown by ROC curves.

V. PROPOSED SYSTEM

This document is to provide a detailed overview of our software product “Long-Term Forecasting the Survival in Liver Transplantation Using Hidden Markov Model”, its parameters and goals. This document describes the project’s target audience and its user interface, hardware and software requirements. It defines how our client, team and audience see the product and its functionality

The main purpose of this proposed system is to put forwards the life span prediction of liver transplant patient uses hidden markov model as a learning process which is powered with Dempster–Shafer reasoning.

VI. FUTURE SCOPE

The purpose of this SRS document is to provide a detailed overview of our software product Long-Term Forecasting the Survival in Liver Transplantation Using Hidden Markov Model, its parameters and goals. This document describes the project’s target audience and its user interface, hardware and software requirements. It defines how our client, team and audience see the product and its functionality.

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VII. CONCLUSION

It is very hard task to predict any once life span, but this job is doing by our doctors since very long for any patient who under gone the knife. As an opportunity to do this proposed model predicts the life span of the patient who is undergone or willing to transplant the liver from the deceased or living Donor. To achieve this proposed model collects the dataset based on the UNOS standard protocols. System uses Fuzzy clustering and Convolution neural network to predict the probability of the data. This process is catalyzed by the Bayesian law and naive bayes theorem to predict the life span in terms of months. And the system also shows the signi?cant sign of learning as the number of dataset increases for the estimated MRR

This model can be enhanced in the feature by applying deep learning mechanism for very huge data using big databases. And this can be deployed in the form of web service or mobile app

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