Hospital Readmission Prediction of Patients using Deep Neural Networks

Problem Statement submitted in partial fulfillment of the requirements for B.Tech Project

By

GROUP NO.:- 23

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BACKGROUND

A Hospital readmission is an episode when a patient who had been discharged from a hospital is admitted again within a specified time interval. Readmission rates have increasingly been used as an outcome measure in health services research and as a quality benchmark for health systems.

Previously baseline classification models were used to estimate the Hospital Readmission Rates. Then Deep Neural Network (DNN) came into picture. A Deep Neural Network (DNN) is an Artificial Neural Network with multiple hidden layers between the input and output layers. Similar to shallow ANNs, DNNs can model complex non-linear relationships. It has been widely used in fields including computer vision, speech recognition, natural language processing, audio recognition, social network filtering, machine translation and bio-informatics where they produced results comparable to and in some cases superior to human experts

MOTIVATION

For Medicare patients, hospitalizations can be stressful, even more so when they result in subsequent readmissions. A number of studies show that hospitals can engage in several activities to lower their rate of readmissions, such as clarifying patient discharge instructions, coordinating with post-acute care providers etc.

We choose this project because deep neural networks which can work effectively to predict the result can be utilized here to avoid unnecessary hospital readmissions.

OBJECTIVE

Our Objective is to predict hospital readmission of patients using deep neural networks. Hospital readmission occurs when a patient is admitted again within a certain interval of time after getting discharged from the hospital. If we predict accurately the no. or percentage of patients readmitted this can be used as an important measure in health services research and as a quality benchmark for health systems like hospitals.

Key goals of this project are:-

 •To find correlations between data features and readmission of patients to hospital.

• Build a predictive model for this based on deep neural networks

PROJECT SCHEDULE

S.NO	TASK	Start Date	End Date	Duration(Days)
1.	Literature Review and Research	5/15/2017	5/30/2017	16
2.	Planning and Methodology	5/31/2017	6/15/2017	16
3.	Algorithm Design	6/16/2017	6/25/2017	10
4.	Coding and Implementation	6/26/2017	7/21/2017	26
5.	Testing	7/22/2017	7/30/2017	9
6.	Code Review and Optimization	7/31/2017	8/12/2017	13
7.	Documentation	8/13/2017	8/26/2017	14
8.	Thesis Report and Paper Work	8/27/2017	9/26/2017	31

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Task Name	May					Jun				Jul				Aug				Sep			
	Apr 30	May 7	May 14	May 21	May 28	Jun 4	Jun 11	Jun 18	Jun 25	Jul 2	Jul 9	Jul 16	Jul 23	Jul 30	Aug 6	Aug 13	Aug 20	Aug 27	Sep 3	Sep 10	Sep 17	Sep 24
Literature Review and Research		16d																				
Planning and Methodology				16d																		
Algorithm Design						10d																
Coding and Implementation								26d														
Testing											9d											
Code Review and Optimization													13d									
Documentation																14d						
Thesis Report and Paper Work																		31d				