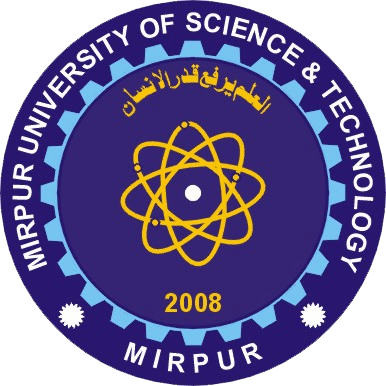
MIRPUR UNIVERSITY OF SCIENCE AND TECHNOLOGY (MUST)

**01 JANUARY, 2022**



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ASSIGNMENT NO 1

DATA MINING

**Admission Trend Analysis (Hospital)**

* **Background:**

One of the most important tasks in the Emergency Department (ED) is to promptly identify the patients who will benefit from hospital admission. Crowding within emergency departments (EDs) can have significant negative consequences for patients. Data relating to hospital admissions of very young children for wheezing illness have been conflicting. Interactions among several environmental, behavioral, social, and biological variables contribute to the epidemiology of infectious diseases (IDs) and have an impact on the healthcare system and hospitalizations. Machine Learning (ML) techniques show promise as diagnostic aids in healthcare.

* **Existing systems:**

Existing systems used to check.

* Heart rate.
* Pulse oximetry.
* Respiratory rate.
* Systolic blood pressure.
* Stratum analyses were performed by age, sex, region, and cause-specific categories.

All these predictors of ICU admission.

**Existing system working on following algorithms:**

Used five machine-learning methods to sequence and predict elective patients:

1. Logistic regression (LR).
2. Random forest (RF).
3. Gradient-boosting decision tree (GBDT).
4. Extreme gradient boosting (XGBoost) Logistic regression.
5. Random under sampling boosting algorithm.

* **Problem existing system:**

The huge amounts of data generated by healthcare transactions are too complex and voluminous to be processed and analyzed by traditional methods like Logistic regression and a decision tree provide less accuracy in results.

* Poor design of systems and processes.
* The system’s inability to respond to changing patient demographics and related requirements.
* A failure to assimilate the rapidly growing and increasingly complex science and technology base.
* Slow adoption of information technology innovations needed to provide care.
* Little accommodation of patients’ diverse demands and needs.
* Personnel shortages and poor working conditions.
* **Purposed solution:**

We propose a five-step approach for the

* Design.
* Suitability assessment.
* Optimization of an admission lounge.

The approach uses a case mix optimization method to select patients for the admission lounge, clinical ward, or for both. Also, it determines the required admission lounge and clinical ward capacities using an Erlangen loss model combined with a novel analytical model.

The approach is integrated into:

* A decision support system.
* Which helps hospitals to identify the suitability of the admission lounge concept.
* Optimize its configuration.
* Identify the potential bed reduction in the clinical ward.

**We investigated the following features seeking to investigate their performance in predicting hospital admission:**

* Serum levels of Urea
* Creatinine
* Lactate Dehydrogenase.
* Creatine kinase.
* C - reactive protein.
* Complete Blood Count with differential
* Activated Partial Thromboplastic Time.
* D Dimer.
* International Normalized Ratio.
* Age and gender.
* Triage disposition to ED unit and ambulance utilization.
* **Achievements:**

Large tertiary hospitals usually face long waiting lines; patients who want to receive hospitalization need to be screened in advance. The patient admission screening process involves a health-care professional ranking patients by analyzing registration information.

The main achievement of this tool include easy access, availability, yes/no result, and low cost. The clinical implications of our approach might facilitate a shift from traditional clinical decision-making to a more sophisticated model.

Machine learning algorithms in predicting the risk of admission from the ED. The GBM performed better (accuracy = 80.31%, AUC-ROC = 0.859).

As toward increasing knowledge and capacity of in the family emergency department discipline

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