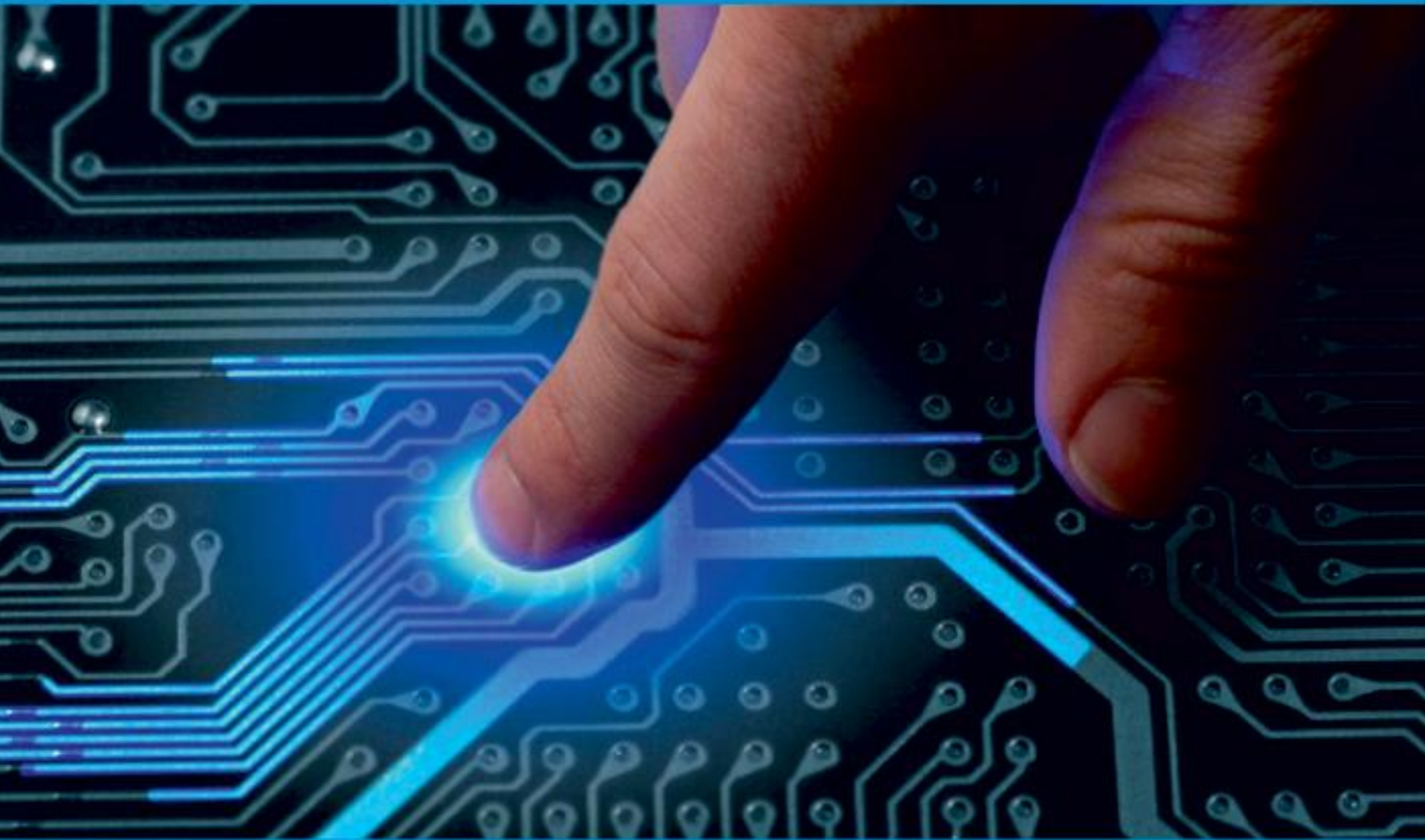
IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 12, Issue 5, May 2024

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.379

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Referred Journal |

|| Volume 12, Issue 5, May 2024 ||

| DOI: 10.15680/IJIRCCE.2024.1205196 |

The Effective Execution of Traffic Safety Management Using Deep Embedded Clustering

Reddy Madhuri, Ch.Kodanda Ramu, N.Mahendra

Miracle Educational Society Group of Institutions, Miraclecity, Bhogapuram, Vizianagaram, India

ABSTRACT: The amount of misfortunes and fatalities invited on by road setbacks is maybe of the fundamental concern in the high level world. As opposed to dispatching ambulances right at the hour of interest, pre-arranging them can lessen the response time and give brief clinical thought. Significant learning strategies hold remarkable potential and have demonstrated to be basic for decisive reasoning and dynamic in the field of clinical consideration organizations. This study presents a significant introduced grouping based method for managing predict ideal regions for crisis vehicle setting. Various variables and models in a land region colossally influence the occasion of road crashes, in this way seeing such associations while model construction is basic. The ongoing concentrate moreover highlights the need of shielding such models during model design to ensure progressing results and does them with the help of another significant learning-based model, Cat2Vec. The proposed structure is moreover differentiated and standard gathering estimations like K-infers, GMM, and Agglomerative batching. Plus, to resolve response time and distance constantly, a smart scoring capacity has in like manner been introduced for the presentation evaluation of various computations. The proposedcrisis vehicle setting system shows outstanding execution, achieving a precision of 95% with k-overlay cross-endorsement and a unique distance score of 7.581 exhibiting the use of the proposed approach is better than the great many different ordinary estimations used.

I. INTRODUCTION

Accidents involving motor vehicles are now among the top killers of both children and adults globally. Victims, their families, and the nation as a whole suffer heavy financial and emotional burdens as a result of the injuries sustained in these tragic events. The annual death toll from vehicular collisions is over 1.3 million. Many people become handicapped as a consequence of the 20–50 million people who suffer non-fatal accidents each year [1]. A rise in the number of deadly road accidents in heavily populated areas, putting a tremendous strain on urban infrastructure, is the most probable unintended consequence of the ever-increasing number of cars on the road. We fear that by 2030, vehicle accidents will have surpassed all other causes of mortality and would rank as the fifth leading killer in the world unless drastic precautions are taken. Despite the high number of casualties, researchers have paid little attention to the issue and have failed to provide systematic solutions to the problem of road safety.

Over 90% of all traffic accidents happen in low- and middle-income countries, including Kenya [2, 3]. Every day, road collisions claim the lives of over a thousand people, accounting for an average of 7 out of 35 injuries [4]. The country's economic activity takes a hit since most of the fatalities and serious injuries happen to people between the ages of 15 and 59, who are also among the most active individuals. Regional trade treaties have grown in importance to Kenya over the last decade, despite the country's lower-middle income status. In 2019, there were 5,186 minor injuries, 6,938 serious injuries, and 3,572 fatalities, according to the National Transport Safety Authority (NTSA), the institution in charge of transportation in Kenya.

Prompt medical treatment for accident victims, accurate data analysis taking into account every factor to diagnose and predict the accident-prone zones in a city, and information about the exact situation to aid personnel are the most important preventative measures that can be taken to decrease the number of injuries and fatalities caused by these deadly accidents. In emergency situations involving vehicle accidents, the time it takes for an ambulance to arrive may have a devastating effect on human lives [5]. Because the number of victims might rise if the ambulance does not arrive at the scene of the accident within the crucial hour, every second counts when it comes to human lives. Considering the unique architecture of each city and the heavy traffic patterns, it is crucial to strategically position emergency responders throughout the day in order to react to emergencies. The absence of training in the deployment of emergency response systems makes it far more difficult to monitor and manage these deadly events. Consequently, first

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Referred Journal |

|| Volume 12, Issue 5, May 2024 ||

| DOI: 10.15680/IJIRCCE.2024.1205196 |

responders and physicians may benefit from the automated, timely, and fast deployment of ambulances since it reduces their work and allows them to make treatment choices early.

Nowadays, decision-making in the medical industry, in particular, has always been aided by technologies like as deep learning and machine learning. We also note in our problem description how these technologies have helped with a variety of road safety issues since their debut. Improving Health Care Output (HCO) must prioritize the immediate healing of all patients and the complete elimination of traffic accident casualties. Because clustering techniques guarantee best positions based on distance metrics and, each centroid's coordinates are the means of the items in the cluster, this work presents the optimal placement of the ambulance (paramedic aid) as a clustering issue [6]. When it comes to clustering difficulties, traditional machine learning methods like k-means, PAM, and agglomerative clustering fall short [7]. An innovative method based on deep learning emerges as a result, offering a practical approach to improving the efficiency of this procedure.

To solve the issue of where in a city an ambulance should be stationed, we provide a new clustering-based method called Deep Embedded Clustering with Auto encoder (DEC-AE). To maximize ambulance location tactics, the DEC-AE approach integrates deep learning, clustering, and auto encoder techniques [4], which is different from typical clustering methods. Using the learnt latent representations to rebuild the input data, DEC is able to successfully capture the fundamental traits and dimensions that contribute to clustering. In addition, DEC uses a combined optimization goal [24] that incorporates feature learning and clustering assignments. By optimizing both sides simultaneously, we may improve cluster separation and create latent space clusters that are both compact and well-separated. DEC-AC is a powerful tool for solving clustering issues since it integrates adaptive clustering with deep learning [5]. It learns useful feature representations using deep neural networks and adjusts the number of clusters depending on the distribution of the input.

Furthermore, DEC is scalable and capable of managing massive datasets, which makes it a good fit for practical uses involving complicated and high-dimensional data. As a result, we may learn more complex and precise things about what variables affect the best places to station ambulances. In order to help find groupings of data with similar patterns, the DEC-AE method additionally uses clustering techniques [5]. In order to strategically situate ambulances to decrease response times and increase coverage, it is possible to identify hotspot locations with greater accident probability or unique risk profiles. Data from a variety of sources, such as road segment attributes, weather conditions, and traffic accident statistics, might be accommodated by this technique. The method improves the accuracy and efficacy of ambulance placement tactics by taking into account many data dimensions, which allow for a more complete picture of the issue.

Dataset contents include traffic accident statistics, road segment details, and meteorological conditions in Nairobi, Kenya. Finding potential variables and factors influencing the city's accident rates and risk patterns, the article does exploratory data analysis on the road survey dataset and the weather dataset. We use Cat2Vec, an embedding technique based on deep learning, to transform categorical characteristics during data pre-processing in order to maintain these correlations and patterns. The distance from the accident site to the closest projected ambulance sites is determined using a unique Distance Scoring Algorithm in order to verify the DEC predicted locations. Different clustering metrics were used and contrasted with other conventional clustering algorithms in order to conduct further evaluations of the technique.

Here are some key points about the technique that is suggested in this paper:
In order to discover possible traits and qualities that lead to accidents and trends across the city, Exploratory Data Analysis (EDA) is used to the real-time accident dataset.
A clustering-based approach is created to find the best places to position ambulances in Nairobi. It uses Deep Embedded Clustering (DEC), a method that preserves feature relationships and patterns. The approach is based on the Cat2Vec deep learning embedding technique, which allows for more accurate clustering.
In order to quantify the efficacy of the DEC model, a new Distance Scoring technique was devised. This approach determines the distance between the collision site and the closest anticipated ambulance position.
To further demonstrate the efficacy of the DEC model, we compare the proposed framework's performance with that of current clustering approaches using a variety of clustering metrics, both with and without the feature selection strategies

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Referred Journal |

|| Volume 12, Issue 5, May 2024 ||

| DOI: 10.15680/IJIRCCE.2024.1205196 |

II. PROBLEM STATEMENT

Xiong et al. [7] and Assi et al. [8] suggested machine learning models that use SVM and Gaussian Mixture models to predict patterns at crash sites, distinguishing between accident and non-accident events. Clustering the accidents using fuzzy c-means, Feed Forward Neural Networks, and SVM allowed them to further forecast the severity of the injuries sustained in the collisions. In order to feed the ML models, data analysis was carried out to extract characteristics from the accident locations. Precision, sensitivity, and accuracy were the metrics used to assess the models. When compared against more conventional methods like k-means clustering and support vector machines, the fuzzy c-means algorithm produced the most accurate results.

An strategy was devised by Ghandour et al. [9] and Tiwari et al. [10] to identify risk variables that lead to fatal road accidents. This approach employs a machine learning hybrid ensemble classifier that is constructed from decision trees and the MSO algorithm. The dataset used was that of the Lebanese Road Accident Platform (LARP), which included 8482 incidents and the corresponding deaths. They used sensitivity analysis of the features to determine the effect of the variables that cause road accident casualties. Seven out of nine of the investigated factors were significantly associated with casualties. The F1 score, precision, AUC-PR curve, and Cohen's Kappa were the metrics used to assess the model performances. Using a multivariate regression model, Granberg et al. [11] created a simulation-based prediction model to estimate the demand for emergency ambulances in a given region.

They used 2005 census data from 2076 local regions to train their genetic regression method. Using R-statistics software, we constructed a distance matrix for each site and sent it into the genetic algorithm; the result was 35 potential sites for the ambulances. With many coefficients, the suggested model preferred a substantial R2 value of 0.71. When compared to models that relied on conventional forecasting methodologies, our distance matrix based approach produced superior outcomes. Topics such as cluster validations, distance functions, and feature selection methods have all been investigated in the context of machine learning clustering [12, 13, 14].

Popular clustering algorithms have offspring in the form of K-means and Gaussian mixture models. Although the distance function method has been around for a while, excessive dimensionality and a lack of space in datasets have severely restricted its use and popularity. Methods using batch clustering, fuzzy c-means clustering, and K-means clustering with a FNMF matrix to depict the correlation patterns of the original data points were suggested by Cao et al. [16] and Moriya et al. [17]. Both methods begin by determining the degree of connection between crash sites, and then group those sites together according to the causes of the incidents.

In order to determine which relevant factors influence the severity forecast of a road accident, Alkheder et al. [18] suggested a method that utilizes decision tree classifier, MLP, and Naïve Bayes. Results showed that the decision tree classifier outperformed the other models with a classification accuracy of 0.08218. When it came to deciding how serious an accident was, factors including age, gender, nationality, and year of accident were more important.

In order to produce a model for forecasting the severity of traffic accidents, Hashmienejad et al. [19] used genetic algorithms and decision trees. Decision tree models CART, C4.5, and ID3 were fed the ruleset generated by the genetic algorithm technique; these models were then tested on the test dataset to ensure their accuracy. The utilized approach outperformed the other methods, namely ANN, SVM, KNN, and Naïve Bayes, with an accuracy of 0.8820, recall of 0.889, f-measure of 0.887, and precision of 0.885.

Models based on the connection of the qualities, which were represented as probability distributions, were developed by Ghosh et al. [1] and Sasaki et al. [2] using Bayesian networks (BN) techniques. Both the causes and the severity of traffic accidents may be better predicted with the use of Bayesian Networks. In addition to MAE and RMSE, these articles also tested the models' sensitivity and specificity to determine how well BSVR worked. To forecast the seriousness of traffic accidents, Taamneh et al. [3] used K-means and Artificial Neural Networks (ANN). By comparing the suggested ANN model's accuracy to that of other machine learning models, we found that it offered a superior result of 0.746.

To acquire the characteristics with a stronger influence on clustering, Dizaji et al. [4] and Tian et al. [24] used auto-encoders to minimize the dimensionality. Kmeans is used to group the features after dimensionality reduction. The method starts with auto encoders to get location representations, skips the decoder step to get a smooth model, and then adds the Kmeans layer on top of the encoder layer to get the final model. Feature selection and cluster creation are two

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Referred Journal |

|| Volume 12, Issue 5, May 2024 ||

| DOI: 10.15680/IJIRCCE.2024.1205196 |

distinct processes that are not optimized in tandem using this method, even if a deep neural network is used to map the data points in feature space beforehand.

A method using a deep auto-encoder's embedded clustering layer was suggested by Alqahtani et al. [5]. This approach uses deep auto encoders to learn the feature representations and assign clusters simultaneously, which is an improvement over previous clustering algorithms. In this specific scenario, all data points that represent accident sites are allocated cluster centers during the optimization phase. After then, the cluster centers are updated repeatedly until the final stable clusters are obtained, and performance is improved even further.

2.1 LIMITATION OF EXISTING SYSTEM

The data's complexity: in order to identify ambulance positioning, most current machine learning algorithms need to correctly understand big and complicated information. Data accessibility: In order to provide reliable predictions, the majority of machine learning models need access to massive datasets. The reliability of the model could be compromised if there is a lack of data in plenty. Bad tagging: Current ML models can only learn as much as the data used to train them. Because the model can't provide reliable predictions if the data is incorrectly identified.

III. PROPOSED SYSTEM

Included in the collection are facts about the weather in Nairobi, Kenya, as well as information about road segments and traffic incidents that have taken place in the city. Finding potential variables and factors influencing the city's accident rates and risk patterns, the article does exploratory data analysis on the road survey dataset and the weather dataset. We use Cat2Vec, an embedding technique based on deep learning, to transform categorical characteristics during data pre-processing in order to maintain these correlations and patterns. The distance from the accident site to the closest projected ambulance sites is determined using a unique Distance Scoring Algorithm in order to verify the DEC predicted locations. Different clustering metrics were used and contrasted with other conventional clustering algorithms in order to conduct further evaluations of the technique.

In order to discover possible traits and qualities that lead to accidents and trends across the city, Exploratory Data Analysis (EDA) is used to the real-time accident dataset.

Optimal sites for ambulance placement around Nairobi are identified using a clustering-based methodology that employs Deep Embedded Clustering (DEC). This method preserves feature correlations and patterns via the use of the Cat2Vec deep learning-based embedding technique, allowing for more accurate grouping.

In order to quantify the efficacy of the DEC model, a new Distance Scoring technique was devised. This approach determines the distance between the collision site and the closest anticipated ambulance position.

To further demonstrate the efficacy of the DEC model, we compare the proposed framework's performance with that of current clustering approaches using a variety of clustering metrics, both with and without the feature selection strategies.

3.1 ADVANTAGES OF PROPOSED SYSTEM

Automated placement of paramedic assistance utilizing Deep Embedded Clustering (DEC) is the goal of the suggested system's methodology, the ideal ambulance positioning framework. This study employs Cat2vec, a model based on deep learning, to improve classification accuracy. It uses low-dimensional embedding to represent high-cardinality categorical variables, while preserving the relationships and patterns found in exploratory data analysis. In order to separate the dataset into training and test sets, this research uses K-fold cross-validation

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Referred Journal |

|| Volume 12, Issue 5, May 2024 ||

| DOI: 10.15680/IJIRCCE.2024.1205196 |

IV. SYSTEM ARCHITECTURE

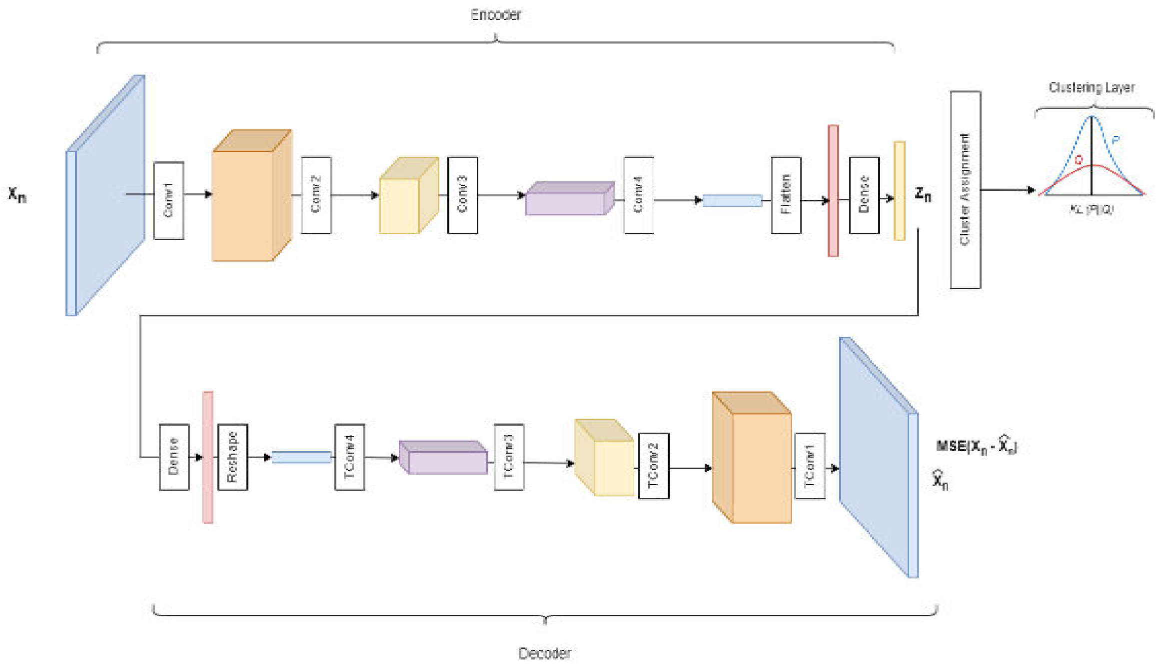


Fig. 4 System Architecture

V. IMPLEMENTATION

5.1 Service Provider

The Service Provider must provide their username and password in order to access this module. Once he logs in, he'll have access to features like Train and Test Data Sets, Check the Bar Chart for Trained and Tested Accuracy, Check Out the Accuracy Results from Training and Testing, Look at Every Ambulance Positioning Forecast, Locate and Examine the Ambulance Positioning Forecast Ratio, And Examine the Findings From Every Ambulance Positioning Variant Obtain Forecasted Data Collections, Check Out Every Remote User.

5.2 View and Authorize Users

The admin can get a complete rundown of all registered users in this section. Admins can see user info like name, email, and address, and they may also grant users permissions.

5.3 Remote User

There are n users in this module at the moment. Registration is required prior to performing any operations. Details will be entered into the database after a user registers. He will be prompted to provide his permitted user name and password upon successful registration. After logging in, users will be able to do things like see their profile, make predictions about their ambulance placement, and register and log in.

VI. ALGORITHM USED

6.1 Naive Bayes Classification using Scikit-learn

So, you're a product manager who wants to know how to sort good and bad feedback from customers. Or It is your job as a loan manager to determine whether borrowers pose a risk or not. Predicting which patients are at risk for developing diabetes is one of your primary responsibilities as a healthcare analyst. The examples all have a common challenge: how to properly categorize reviews, loan applications, and patients.

When dealing with a big dataset, the simplest and fastest classification method is Naive Bayes. Spam filtering, text categorization, sentiment analysis, and recommendation systems are just a few of the many successful uses of the Naive Bayes classifier. For the purpose of class prediction, it employs Bayes' theorem of probability.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Referred Journal |

|| Volume 12, Issue 5, May 2024 ||

| DOI: 10.15680/IJIRCCE.2024.1205196 |

6.2 Classification Workflow

The first stage in any categorization process is to comprehend the issue at hand and to locate possible traits and labels. In order to influence the label's output, features must be considered. Managers at financial institutions often record clients' ages, occupations, income levels, locations, loan and transaction histories, and credit scores when deciding how much money to lend them. These details, which the model uses to categorize clients, are called features.

There are two parts to the categorization process: learning and assessment. The classifier goes through two distinct phases: learning, when it trains its model on a dataset, and evaluation, where it is tested to see how well it performed. Several metrics, including recall, precision, accuracy, and error, are used to assess performance

6. 3 Naive Bayes Classifier?

Using Bayes Theorem as its foundation, Naive Bayes is a method for statistical categorization. Among supervised learning algorithms, it is among the most basic. The method that is dependable, quick, and accurate is the Naive Bayes classifier. Performing quickly and accurately on massive datasets are naive bayes classifiers.

The naive bayes classifier works on the assumption that each feature's impact on a class is completely separate from any other features. Consider how a borrower's age, geography, income, and history of loans and transactions affect the loan application's desirability. Regardless of whether these traits are reliant on one other, they are nevertheless evaluated separately. This assumption is seen as naïve since it simplifies calculation. What we mean by this is "class conditional independence.

6.4 Support Vector Machine

One kind of supervised machine learning method that can identify outliers, classify data, and run regressions is Support Vector Machine, or SVM. Connecting two classes with a straight line is how the linear support vector machine classifier operates. Those data points that lie on the left side of the line will be classified as one class, while those that lie on the right side will be classified as another. The concept is simple, but the number of possible lines is endless. How can we determine which line will effectively sort the data? The support vector machine (LSVM) algorithm is useful here. Not only will the LSVM algorithm choose a line that divides the two groups, but it will also avoid the nearest samples to the maximum extent feasible. The "support vector" in "support vector machine" really describes two position vectors that are drawn from the origin to the locations that determine the decision boundary.

6.5 K Nearest Neighbor Algorithm

Many different types of organizations make use of K-Nearest Neighbors, or KNN, as it is one of the most basic machine learning algorithms. Lazy learning algorithms like KNN do not need any parameters. A method is considered non-parametric if and only if it does not presume anything about the data it uses. Without respect to the characteristics represented by the numerical values, it selects data points according to their closeness to one another. A lack of training phase is indicative of a lazy learning algorithm. As a result, we can categorize fresh data pieces as soon as they appear

6.6 Decision Tree Classification

Classification using Decision Trees, metrics for attribute selection, and methods for developing and improving Python Scikit-learn package is used to create a decision tree classifier.If you're a marketing manager, you want to target the people who will buy your product the most. Discovering your target demographic in this way can help you save money on advertising. One of your goals as a loan manager should be to reduce the default rate by identifying applications for loans that pose a risk. A classification issue is the process of sorting consumers into two groups: those who are likely to be profitable and those who are not, or who pose a low risk of defaulting on a loan. There are two stages to classification: learning and prediction. The learning process involves building the model using the provided training data. The prediction stage involves using the model to anticipate the response based on the provided data. If you're looking for a popular and easy-to-understand categorization method, consider Decision Tree. It is applicable to problems involving both classification and regression.

6.7 Random Forest Algorithm

Random forest is an ensemble learning-based supervised machine learning technique. When you use the same method several times or combine various kinds of algorithms, you create a more robust prediction model. This technique is called ensemble learning. The term "Random Forest" comes from the fact that it is a compilation of many decision trees, an example of an algorithm of the same kind. The random forest approach is versatile enough to be used to both classification and regression problems.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Referred Journal |

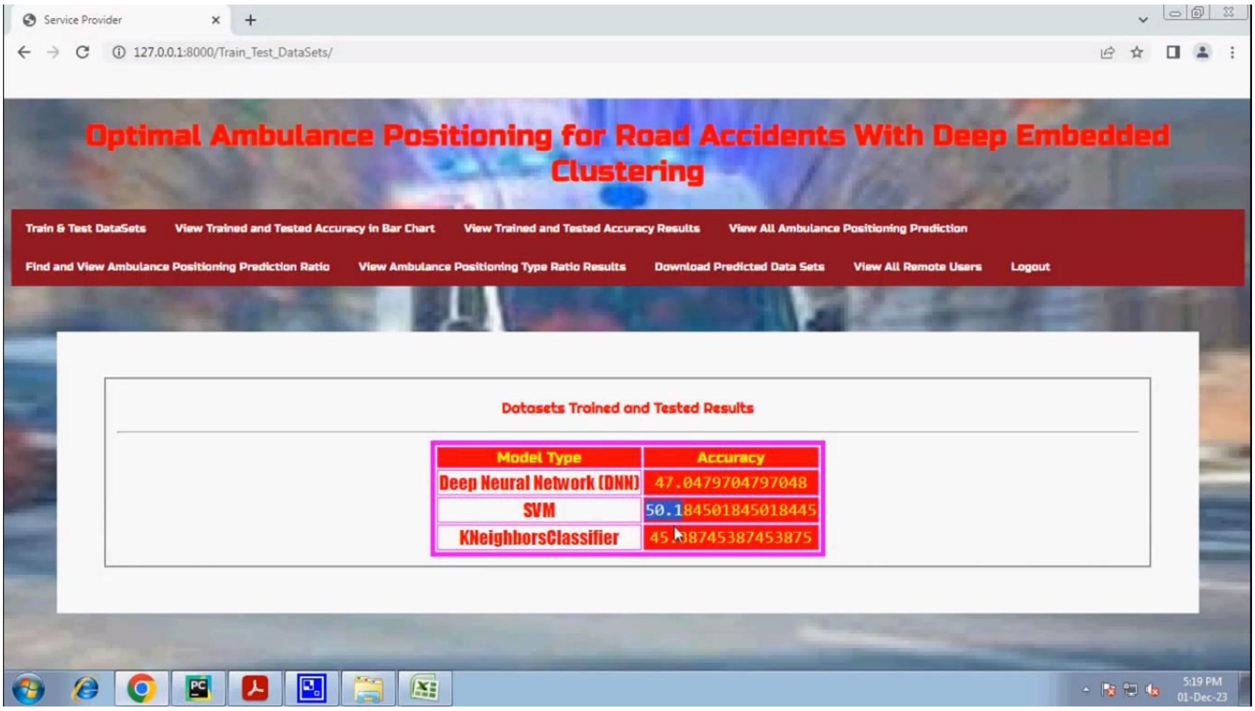
|| Volume 12, Issue 5, May 2024 ||

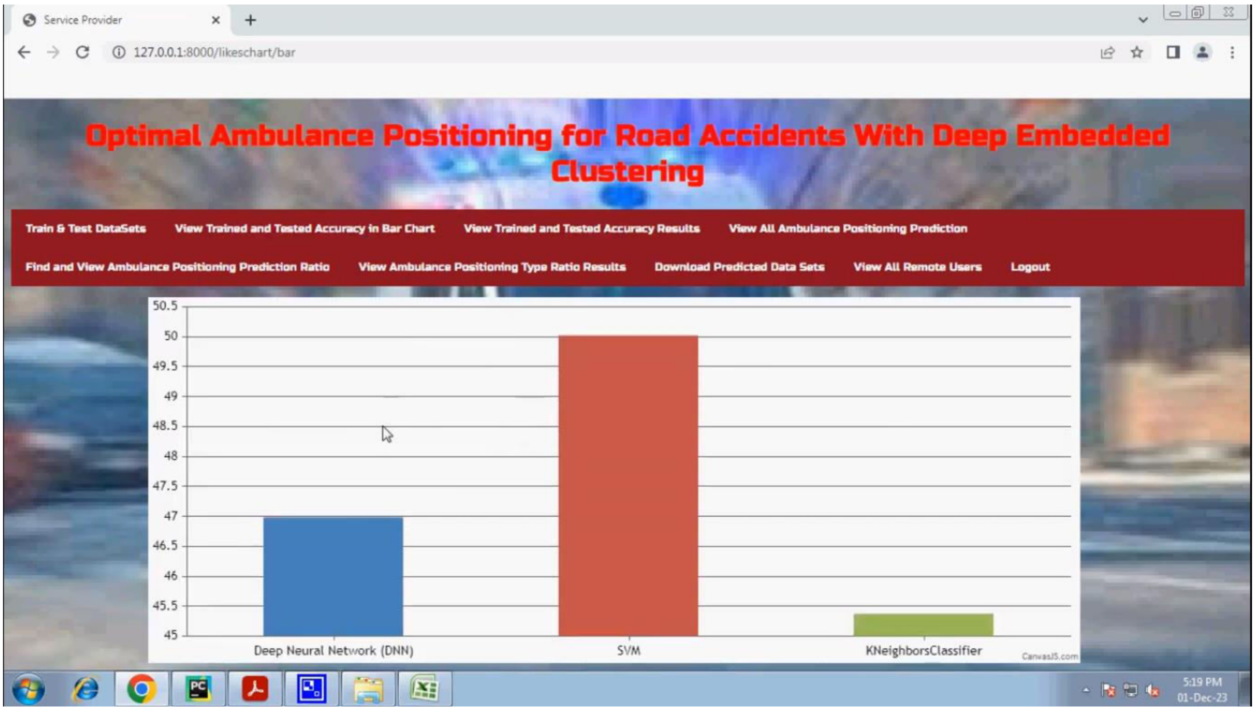
| DOI: 10.15680/IJIRCCE.2024.1205196 |

6. 8 XGBoostAlgorithm:-

Efficient, versatile, and easily transportable, XGBoost is a distributed gradient boosting toolkit with optimizations. The Gradient Boosting framework is used to develop machine learning algorithms. Many data science issues may be quickly and accurately solved using XGBoost's parallel tree boosting (GBDT, GBM).

VI. EXPECTED RESULTS

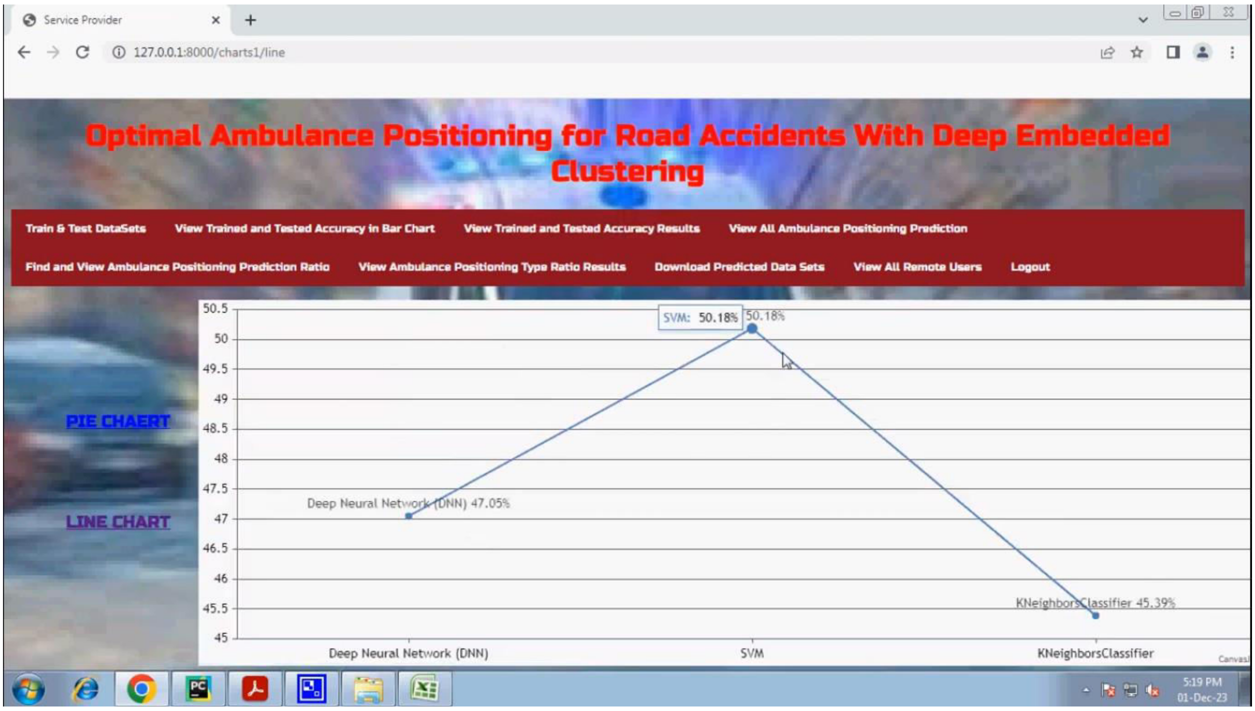


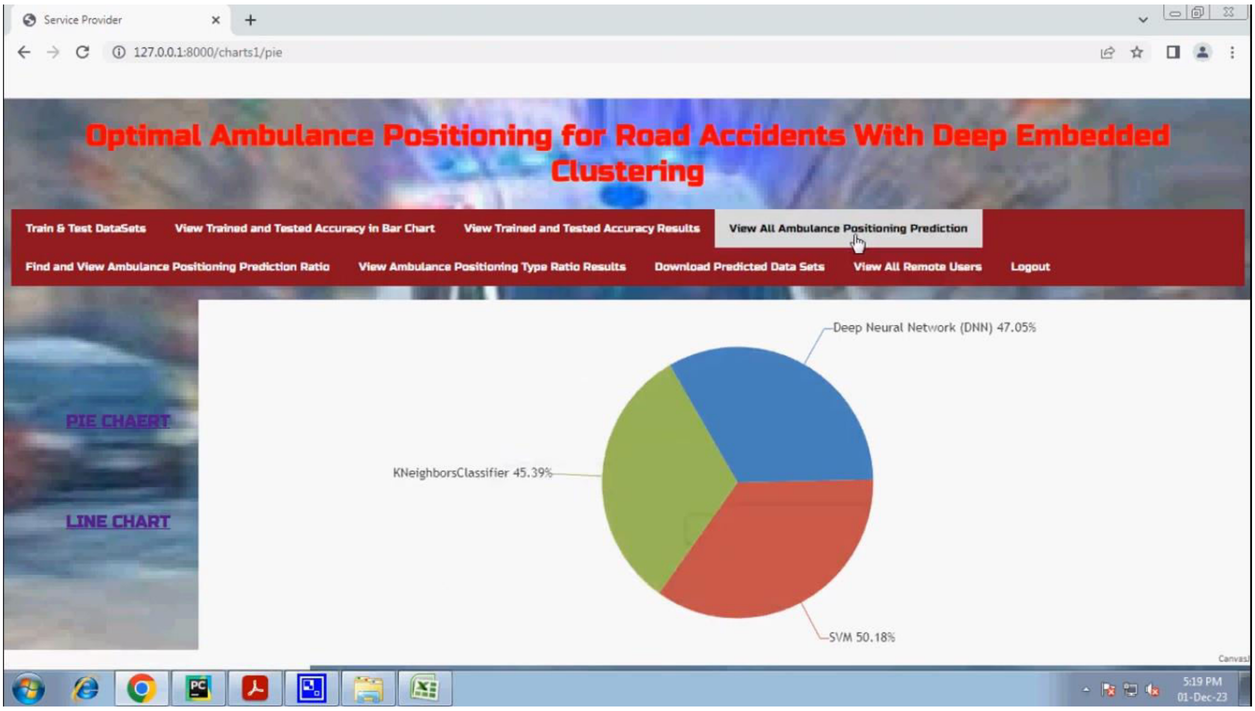


| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Referred Journal |

|| Volume 12, Issue 5, May 2024 ||

| DOI: 10.15680/IJIRCCE.2024.1205196 |





| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Referred Journal |

|| Volume 12, Issue 5, May 2024 ||

| DOI: 10.15680/IJIRCCE.2024.1205196 |

VIII. CONCLUSION

The effective execution of traffic safety management programs today relies heavily on methodologies that have developed over the last 20 years for pinpointing accident hotspots and choosing ideal paramedic locations. Using the Nairobi accidents dataset from 2018–2019, this research sought to create and evaluate algorithms that may predict the best places to place ambulances in the city of Nairobi. The final model used the Cat2Vec model to incorporate numerical data for each category attribute, transforming categorical data into numerical data. After processing the data and selecting features, a clustering-based approach was used. This approach included Deep Embedded Clustering in addition to standard machine learning algorithms such as K-Means, GMM, and Agglomerative clustering. Five clusters were identified, and the optimal ambulance positions were found at the centroids of these clusters. Various performance criteria, such as the Silhouette score, Calinski-Harbasz score, Davies Bould in Score, and V-measure, were used to assess the clustering methods. The distance between the centroid and the expected locations of the ambulances was assessed using a new scoring system called Distance score. When tested using k-fold crossvalidation, the DEC-AE

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Referred Journal |

|| Volume 12, Issue 5, May 2024 ||

| DOI: 10.15680/IJIRCCE.2024.1205196 |

model that included Cat2Vec embeddings had the best accuracy, 95%. There is little distance between potential collision sites and ambulance placements, according to the DEC-AE model's distance score of 7.581, which is more than that of conventional machine learning techniques. According on the results of the aforementioned clustering measures, the suggested DEC-AE model always performs better than competing models. The DEC-AE model's ability to reliably cluster data and detect patterns is shown by this discovery. Policymakers will be able to use the study's recommendations for optimal investment and security measures.

REFERENCES

1. Improving product marketing by predicting early reviewers on E-Commerce websites
S. Kodati, M. Dhasaratham, V. V. S. S. Srikanth, and K. M. Reddy, "Improving product marketing by predicting early reviewers on E-Commerce websites," Deleted Journal, no. 43, pp. 17–25, Apr. 2024, doi: 10.55529/ijrise.43.17.25.

2. Kodati, Dr Sarangam, et al. "Classification of SARS Cov-2 and Non-SARS Cov-2 Pneumonia Using CNN." Journal of Prevention, Diagnosis and Management of Human Diseases (JPDMHD) 2799-1202, vol. 3, no. 06, 23 Nov. 2023, pp. 32–40, journal.hmjournals.com/index.php/JPDMHD/article/view/3406/2798, https://doi.org/10.55529/jpdmhd.36.32.40. Accessed 2 May 2024.

3. V. Srikanth, "CHRONIC KIDNEY DISEASE PREDICTION USING MACHINE LEARNING ALGORITHMS," IJTE, pp. 106–109, Jan. 2023, [Online]. Available: http://ijte.uk/archive/2023/CHRONIC-KIDNEY-DISEASE-PREDICTION-USING-MACHINE-LEARNING-ALGORITHMS.pdf

4. V. SRIKANTH, "DETECTION OF PLAGIARISM USING ARTIFICIAL NEURAL NETWORKS," International Journal of Technology and Engineering, vol. XV, no. I, pp. 201–204, Feb. 2023, [Online]. Available: http://ijte.uk/archive/2023/DETECTION-OF-PLAGIARISM-USING-ARTIFICIAL-NEURAL-NETWORKS.pdf

5. V. SRIKANTH, "A REVIEW ON MODELING AND PREDICTING OF CYBER HACKING BREACHES," IJTE, vol. XV, no. I, pp. 300–302, Mar. 2023, [Online]. Available: http://ijte.uk/archive/2023/A-REVIEW-ON-MODELING-AND-PREDICTING-OF-CYBER-HACKING-BREACHES.pdf

6. S. Kodati, M. Dhasaratham, V. V. S. S. Srikanth, and K. M. Reddy, "Detection of fake currency using machine learning models," Deleted Journal, no. 41, pp. 31–38, Dec. 2023, doi: 10.55529/ijrise.41.31.38.

7. "Cyberspace and the Law: Cyber Security." IOK STORE, iokstore.inkofknowledge.com/product-page/cyberspace-and-the-law. Accessed 2 May 2024.

8. "Data Structures Laboratory Manual." IOK STORE, www.iokstore.inkofknowledge.com/product-page/data-structures-laboratory-manual. Accessed 2 May 2024.

9. Data Analytics Using R Programming Lab." IOK STORE, www.iokstore.inkofknowledge.com/product-page/data-analytics-using-r-programming-lab. Accessed 2 May 2024.

10. V. Srikanth, Dr. I. Reddy, and Department of Information Technology, Sreenidhi Institute of Science and Technology, Hyderabad, 501301, India, "WIRELESS SECURITY PROTOCOLS (WEP,WPA,WPA2 & WPA3)," journal-article, 2019. [Online]. Available: https://www.jetir.org/papers/JETIRDA06001.pdf

11. V. SRIKANTH, "Secured ranked keyword search over encrypted data on cloud," IJIEMR Transactions, vol. 07, no. 02, pp. 111–119, Feb. 2018, [Online]. Available: https://www.ijiemr.org/public/uploads/paper/1121_approvedpaper.pdf

12. V. SRIKANTH, "A NOVEL METHOD FOR BUG DETECTION TECHNIQUES USING INSTANCE SELECTION AND FEATURE SELECTION," IJIEMR Transactions, vol. 06, no. 12, pp. 337–344, Dec. 2017, [Online]. Available: https://www.ijiemr.org/public/uploads/paper/976_approvedpaper.pdf

13 . SRIKANTH MCA, MTECH, MBA, "ANALYZING THE TWEETS AND DETECT TRAFFIC FROM TWITTER ANALYSIS," Feb. 2017. [Online]. Available: http://ijmtarc.in/Papers/Current%20Papers/IJMTARC-170309.pdf

14 Srikanth, V. 2018. "Secret Sharing Algorithm Implementation on Single to Multi Cloud." International Journal of Research 5 (01): 1036–41. https://journals.pen2print.org/index.php/ijr/article/view/11641/11021.

15. K. Meenendranath Reddy, et al. Design and Implementation of Robotic Arm for Pick and Place by Using Bluetooth Technology. No. 34, 16 June 2023, pp. 16–21, https://doi.org/10.55529/jeet.34.16.21. Accessed 20 Aug. 2023.

16. Babu, Dr P. Sankar, et al. "Intelligents Traffic Light Controller for Ambulance." Journal of Image Processing and Intelligent Remote Sensing(JIPIRS) ISSN 2815-0953, vol. 3, no. 04, 19 July 2023, pp. 19–26, journal.hmjournals.com/index.php/JIPIRS/article/view/2425/2316, https://doi.org/10.55529/jipirs.34.19.26. Accessed 24 Aug. 2023.

17. S. Maddilety, et al. "Grid Synchronization Failure Detection on Sensing the Frequency and Voltage beyond the Ranges." Journal of Energy Engineering and Thermodynamics, no. 35, 4 Aug. 2023, pp. 1–7, https://doi.org/10.55529/jeet.35.1.7. Accessed 2 May 2024.

18. K. Meenendranath Reddy, et al. Design and Implementation of Robotic Arm for Pick and Place by Using Bluetooth Technology. No. 34, 16 June 2023, pp. 16–21, https://doi.org/10.55529/jeet.34.16.21. Accessed 20 Aug. 2023.

19. [Managing Mass-Mailing System in Distributed Environment]. (n.d.). http://www.ijmetmr.com/olaugust2015/VSrikanth-119.pdf.