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Accurate Prediction of Location Based Garbage Management System using Convolutional Neural Network Algorithm Compared with Residual Neural Network Algorithm

INTRODUCTION

- In this research paper, Location Based Garbage Management System refers to a waste management that utilizes location data to optimize garbage collection and disposal processes.
- LBGM specifies the context of the prediction task. It implies that the system relies on location data to manage garbage effectively.
- The study involves two groups, each with a sample size of 10 patterns, using 'outdoor_garbage.csv' data set for Garbage Detection with deep learning. Prediction settings G-power 90%, CI 95% & α=5%.
- In this research study , Convolutional Neural Network algorithm is compared with the algorithm such that Residual Neural Network to enhance accuracy.
- The advantage of Convolutional Algorithm has proven to be faster when compared with other classification models.
- The aim of the study is to develop and evaluate a predictive model that can effectively forecast various aspects of a garbage management system within specific geographic locations.

Fig.1.Smart Bins for Smart City Using Networks

MATERIALS AND METHODS

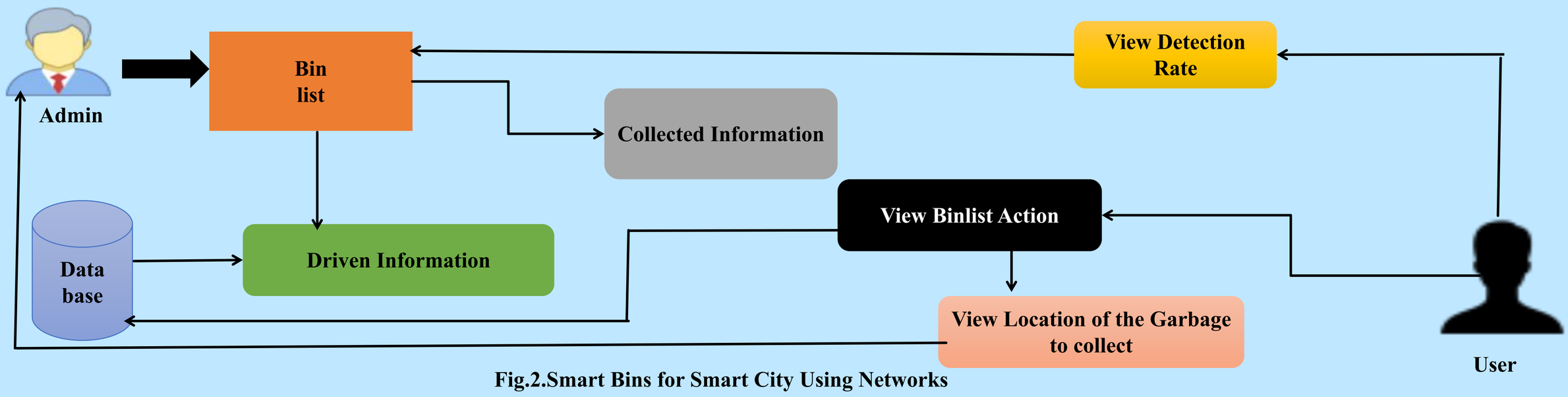

Fig.2.Smart Bins for Smart City Using Networks

RESULTS

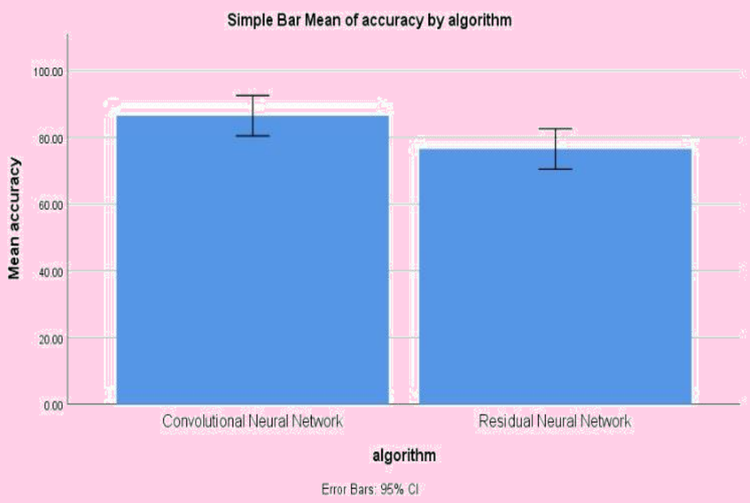

Fig.3.Comparsion of CNN and RNN using SPSS

	Algorithm	N	Mean	Std. Deviation	Std. Error Mean
Accuracy	CNN	10	86.5000	2.02585	0.25743
	RNN	10	76.5000	2.05352	0.32743

Table1.To implement the garbage detection using CNN and RNN are used for evaluation

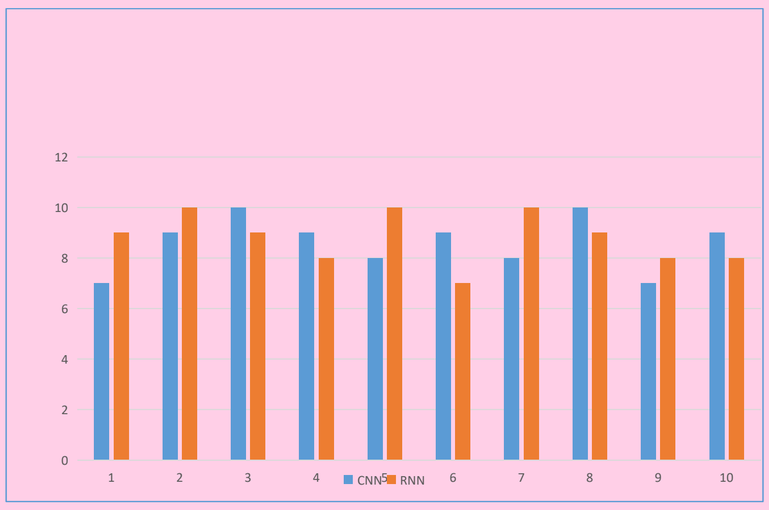

Fig.4.Comparison of CNN vs RNN among dataset

DISCUSSION AND CONCLUSION

- Based on t-test Statistical analysis, the significance value of p=<0.002 (independent sample t- test p<0.05) is obtained and shows that there is a statistical significant difference between the CNN and RNN.
- Overall , the accuracy of the Convolutional Neural Network is 97.2 % and it is better than the other algorithm.

  Residual Neural Network - 95.5%
- By using GPS and mapping technologies, garbage collection routes can be dynamically optimized based on real-time data such as the location and quantity of waste bins.
- This minimizes fuel consumption, reduces vehicle emissions, and lowers operational costs for waste management authorities.
- From the work , it is concluded that the Convolutional Neural Network algorithm attains the high accuracy when comparing with other Deep Learning Algorithms in Garbage management system using RNN.

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