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Detection of an Electricity Losses Using Machine Learning Algorithm

Pratik Sagale¹, Digvijay Jagtap², Vikas Lomte³

Department of Computer Engineering, AISSMS IOIT, Pune, Maharashtra, India ¹

Department of Computer Engineering, AISSMS IOIT, Pune, Maharashtra, India ²

Department of Computer Engineering, AISSMS IOIT, Pune, Maharashtra, India³

ABSTRACT: Developing countries, especially India, are facing a big problem of power losses due to Electricity theft and illegal interference in electrical meters. In the system a smart meter is installed at every user side and the main server is maintained at the admin side, We use the OCR algorithm for smart meter rating there are many methods studied for detecting electricity theft, but very few studies used machine learning to discover electricity theft or loss of electricity. This system compares several machine learning algorithms and gives predictive accuracy, For the training and testing, we use OCR and CNN algorithm. Keywords - CSV, Machine Learning, OCR, smart meter,

I. INTRODUCTION

Electricity theft has developed as a severe issue with in electricity sector, particularly in the developing countries. Electricity theft costs the government a lot of money. In certain nations, the situation is so bad that governments are losing money instead of making money. In some circumstances, the government must pay subsidies to the power sector in able to preserve electricity prices affordable. financial loss, there are fewer funds available for investments to increase traditional power capacity, and administrations are still unable to meet the ever-increasing demand for electricity. In those other situations, the problem has gotten so bad that the afflicted electrical systems are on the verge of passing bankrupt. However, power theft is so frequent in developing and underdeveloped countries that it is also kept out of the public spotlight. Tampering with metres to portray a low metre reading, stealing electricity via bypassing a barrier, billing inconsistencies, and unpaid bills all are symptoms of electricity theft. Billing irregularities include erroneous reading collected by bribed service personnel and purposeful bill manipulation by office personnel in exchange for illicit payment from the customer. Various nontechnical and technical approaches for detecting electrical pilfering have been proposed in the past. Nontechnical methods may include inspecting clients with suspect load profiles, in whose case we develop a supervised ML-based theft detection model that determines whether an anomalous usage pattern has happened in the smart meter. Different nontechnical and technical methods were proposed in the past to detect electricity pilfering. Nontechnical methods may include inspection of the customers with suspicious load profile so system implement a supervised ML-based theft detection model that detects weather any fraud pattern has occurred in smart meter readings'

II. PROBLEM STATEMENT

Our proposed system is implemented using a Machine Learning-based model that is trained on to detect electricity losses.

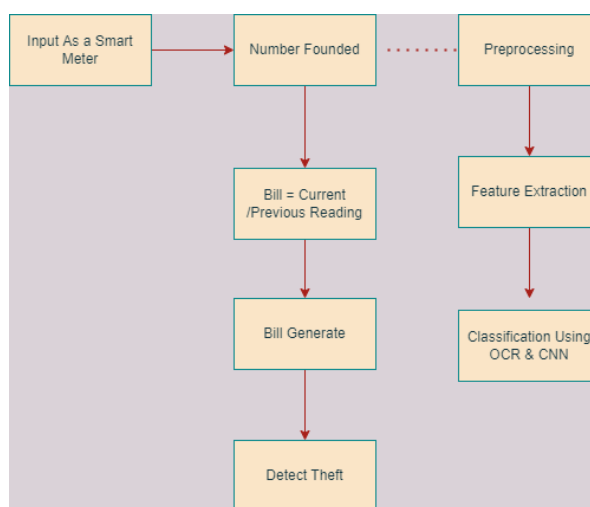
III. INDENTATIONS AND EQUATIONS

Smart meter dataset is collected from Kaggle ,having number of missing numbers and outlier because of this reason system have performed comprehensive data pre-processing which comprises of three Sigma rule , inter- polation and normalising algorithms, Addition to it a dataset has a small amount of instance for electricity thefts that makes the classification model biased due to training of it on majority honest instances. This technique has improved the performance of the OCR classifier which has precision, theft score and recall of 94.1% and 96% .Afterwards that module has been over fitting issues due to training the model of the large series data which extracts relevant features from the data. This is having higher generalizing performance by securing accuracy of 88.2% and 84% on training and testing data. Finally, OCR method is applied to classify the data into honest and dishonest consumers. To enhance the

performance of OCR algorithm, calculation is used for parameters' optimization. This method improved the performance of OCR and However, as dataset increases, the execution time of our proposed model

FIGURES AND TABLES

For training, System employed a machine learning technique, and for testing, system used an OCR algorithm. OCR is very useful for object detection. In this project, system used a digital metre as input and subsequently trained our project using a data. and identify the theft by using OCR. Optical character identification (OCR) methods allow computers to automatically analyse 1 printed or handwritten documents and convert text data into editable formats so that computers can process them more effectively.



IV. CONCLUSION

This paper present the image processing system for electricity smart meter. System detects the electricity theft using machine learning algorithm. System have used OCR algorithm This system helps us in improving electricity utilization and they will no bare loss.

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