INDIAN POSTAL DELIVERY AUTOMATION

A MAJOR PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

Certified that this project report titled "**INDIAN POSTAL DELIVERY AUTOMATION**" is the bonafide work of "**PALURU SURYA KIRAN [RA1911026010057], DARSHAN RAMESH [RA1911026010011]**", who carried out the project work under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasionon this or any other candidate.

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ABSTRACT

The Indian Postal Automation project aims to address the inefficiency and challenge in India's existing manual postal system. This project aims to design and implement an automated postal system that can improve the speed and accuracy of postal operations while reducing the cost of operations. This paper addresses the most common and essential problem in the postal department of parcel segregation tasks by proposing a fully-automated solution. The proposed methodology uses bidirectional LSTM for handwritten address recognition, followed by address parsing techniques and the construction of knowledge graphs to pinpoint the accurate location of the delivery. This proposed solution can bring the parcel segregation process from hours to minutes.

CHAPTER 1:
INTRODUCTION

India is one of the world's most significant postal systems, with roughly 1.5 lakh post offices and around 6 lakh post boxes for collecting packages. The suggested solution employs BiLSTM for handwritten address recognition, then employs address parsing methods and knowledge graph creation to determine the precise location of the delivery.

Bidirectional LSTM (BiLSTM) is a recurrent neural network used primarily for natural language processing. Unlike standard LSTM, the input flows in both directions and can utilize information from both sides. It is also a powerful tool for modeling the sequential dependencies between words and phrases in both directions of the sequence.

Address parsing is breaking down an address into its parts. Many applications, such as geocoding and record linking, depend on this activity. Determining the various components of a lesson can be helpful when locating a specific location using textual information.

1.1 MOTIVATION

Every day, millions of letters and couriers are delivered worldwide. Indian postal services earn around 1700 crores per annum and is said to be world's most widely distributed postal system, with a collection of around 1.5 lakh post offices. More than 100 million parcels are delivered every year on average There are almost 6Lac post boxes from which letters are collected.

Usually when a courier or mail is sent to PO, a person manually reads and segregates the letters based on which city and state the letter is supposed to go. Automatic sorting of mailing items plays a crucial role in the postal service system. In such a situation, an OCR module is required to recognise the postal address on mailing items and a parser module to parse the address.

1.2 OBJECTIVE

- Design and build an OCR model to recognize the handwritten text written on the postal card.
- Design and build an address parser for parsing the address information form the text extracted from the OCR model.
- Construction of Knowledge graph from the data returned by the address parser.
- Generation of exact location from the data in knowledge graph.

1.3 INNOVATION IDEA

We There is no previous model exists that is fully automated with minimal human intervention. We are aiming to design an efficient solution that is fully automated as well as easy to use.

There is no address parser designed for Indian postal address. Current Indian postal automation projects are limited to pin-code detection and segregation based on the pin-code. We are aiming to design the project that can take address into consideration to minimize the error to a greater extent.

1.4 CHALLENGES IN EXISTING SYSTEMS

- There is no address parser exists for Indian addresses exists (to the best of my knowledge), and mostly previous models are pin-code based that fails to work in case of wrongly detected pin-code.
- Existing models are unable to identify Indian regional address terms like nagar, marg that are very common into consideration and fails to respond for those.
- Rule-based techniques are computationally efficient and provide promising results on standardized addresses but are limited in terms of classification and require intense domain knowledge