

ISA - An Intelligent Shopping Assistant

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Abstract— The Intelligent Shopping Assistant is a web based mobile application which helps the users with their everyday grocery shopping by offering features such as natural language processed shopping lists and provide quick and easy shop navigation and ordering the items in the lists. The ISA lets local shop owners to open a portal and provide the list of products its selling. The users and easily capture the written list of items using their mobile camera, the ISA will process the items from the lists and add the items in the cart from the nearest shop and will redirect you to the transaction portal after he/she verifies all the items. It will reduce the time and effort of the users as well as the shop owners and provide a well written database for all their sold items. The following project report briefly describe the current and planned features of ISA.

Index Terms— ISA – Intelligent Shopping Assistant, NPL – Natural Language Processing, Shopping Portal

INTRODUCTION

Grocery shopping is one among the foremost fundamental everyday activities. For most customers a shopping list is an integral a part of the shopping experience. Studies have suggested that shopping lists serve, e.g., as memory aids, as a tool for budgeting and as how to efficiently organize routine shopping visits. Whenever we go to shopping, we always tend to make a shopping list so that we don't forget what we are buying. Most of the time we go to our local market and dictate the shopping list to the shop owner and he packs our products. The ISA is a tool to help you with your shopping without going out to the market and reduce your workload.

OVERALL DESCRIPTION

We have developed a mobile shopping assistant, ISA, that runs on mobile phones that lets you capture the shopping lists and all the shopping items on the lists will be automatically added to the cart and provide

you a portal for transaction after you complete the verification of the items.

PURPOSE

The purpose of this project is to provide a simple interface to the users who are for some reasons aren't able to go to buy the groceries or simply too lazy to go out and buy them. It automates the product verification and selection process and lets the users saves a lot of time.

MOTIVATION AND SCOPE

The motivation behind this project is that in our fast-paced lives, people don't have much time to go out to the market and buy products and groceries. So, this application will help them save time and effort. The Scope of the project is that all the people irrespective of age can buy their groceries if for some reasons they are not able to go out.

LITERATURE SURVEY

As we all know that to create something or to produce results, the first and foremost step is to do some background study on that topic so that we can know where and in what direction we have to move in order to accomplish the work. By doing this kind of work study, we can efficiently and quickly device our plan to resolve the problems and find the solutions.

As the online shopping is introduced to the Indian market not so long ago, there are not many studies that are done in this field as the people do not trust the online shopping that much, but as time passes by the people of India are more and more trying to indulge in activities of online shopping. But still they prefer to buy products from their local markets instead of ordering online as they think they will be scammed by paying for premium products while

getting fake products delivered which have been seen many times over the past few years.

However, there are recent improvements in the field of online shopping as various shopping websites are promising genuine products and also helping customers by providing excellent customer support and return policies that has increased the trust factor of online shopping in the Indian market and recently a boom in online shopping has been noticed. But still a large no. of people tend to go personally in the market and buy the stuff that they want. This is due to the fact that they trust the local shops more and believe that if anything goes wrong, they can directly talk to the shop owner which is not the case in online shopping. This is the major point for the people sticking to the local shops and not to the online shopping.

ONLINE SHOPPING VS OFFLINE SHOPPING

The major reason why people try to buy from the local markets is the environment. People go out to their locality, see familiar faces which they trust and those people helps them choose products which they think are good and the buyers believe them also due to the long-term relationship they have formed over the years.

On the other hand, when people are buying from online portals like Amazon, flipkart, etc., the buyer do not have much information about the seller and hence they worry about whether the product is genuine or not.

Also, there is no such portal which provides the local shop owners to sell their products online in their locality where they have built trust. If the buyer has information about the seller and knows that the seller is from his locality, then he wouldn't afraid of buying online because then he does not have the insecurity that the product is genuine or not because then he can personally go to the shop owner and resolve his problems which also saves him time and effort of filing a complaint to the portal and waiting for them to resolve the issue. This leads to better understanding between the local market and provides a platform for them to sell their products online.

This is the main reason why people in Indian market tend to buy products from their local market instead of shopping online.

PROBLEM STATEMENT

The problem arises now from the above research papers is how to reduce the gap created between the online and offline shopping that will provide the sellers a platform to sell their products online and on the same time the buyers can have information and freedom to select the seller they want to buy from their local market shops from that platform.

EXISTING SYSTEM

There are various existing systems like Amazon shopping, flipkart, grofers, etc, but none of them provides the user an option to buy products from their local markets and also they do not provide much information about the sellers. Also they don't provide any method to add multiple items at once to their carts and the customers have to select each and every item individually and then add to the cart.

These problems are solved from our proposed system which bridges the gap between the online shopping and offline shopping and also provides various features to reduce the shopping time by almost 40%.

PROPOSED SYSTEM

Contrary to the other shopping sites like Amazon, flipkart, etc, the ISA provides an interface between the shoppers and the local shops which increases the trust of the buyers as the place from where they are going to buy is located near them and their details are known. Also, it reduces a lot of work of the buyers by automatically verifying and selecting the products from the hand-written shopping lists and redirecting the user to the payment portal after verification.

METHODOLOGY USED

This undertaking is a blend of web innovation and AI. We have utilized MERN Stack to construct the frontend web interface of the task and python for the backend picture handling for the venture.

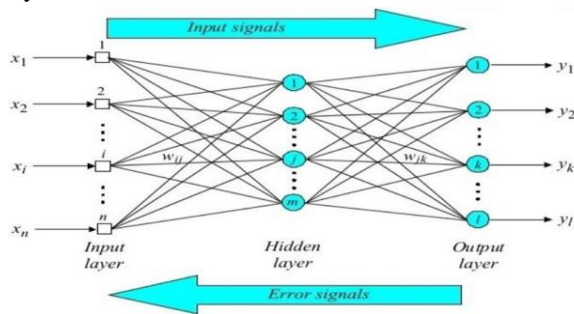
For Machine learning, we are going to utilize Deep Learning utilizing Neural Networks to get the most precise outcomes.

Neural Networks:

A neural system is a type of machine learning algorithm which tries to imitate the working of human brain. Just like our brain is made up of millions of neurons, a neural network is also made up of neural nodes which have values and every neural node is connected to other nodes with some nodes. The weights and values are adjusted while training and this process is called back propagation.

Essentials of Neural Networks:

The neural network is made up or neurons. These neurons or nodes are connected in the form of layers. For the basic neural network, there is one input layer, n hidden layers which are used to adjust the weight and accuracy of the network and finally one output layer.

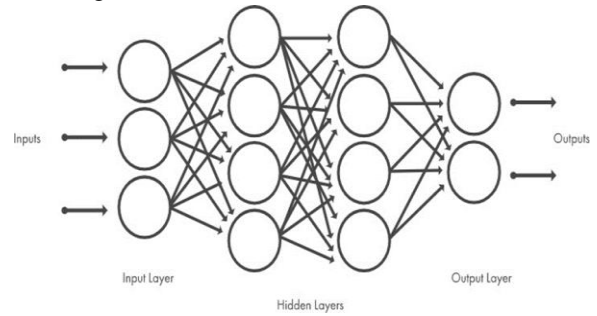


The output layer generally produces the result in the range of 0-1 and each output layer produce certain probability value of that particular output. Then out of the probabilities produced by the neural networks, the output with the highest probability is chosen as the output. Then the output produced by the network is checked by the labels provided by the user and error is calculated. Based on the error the waits and values are adjusted again to reduce the error and increase the efficiency of the network. This process is repeated various times for training the network. The neural network provides the most accurate results after training but it takes long time to get trained and it is difficult to understand by humans.

Deep Learning:

Deep learning is an extension of neural networks which can be used for complex machine learning tasks. It is generally used for tasks like facial recognition, image processing where the AI needs to identify various parts of the images or datasets. It can have upto 150 hidden layers that are used for feature selections of various parts of the data like identifying face then finding features in the face like eyes, nose, mouth, etc., this type of complex processing is don't

by large no. of hidden layers present in the Deep Learning.



The expression "Deep" refers to the number of hidden layers in the neural system. The enormous no. of hidden layers can be specifically programmed for feature selection process and the user can define which hidden layer(s) are responsible for identifying specific feature(s).

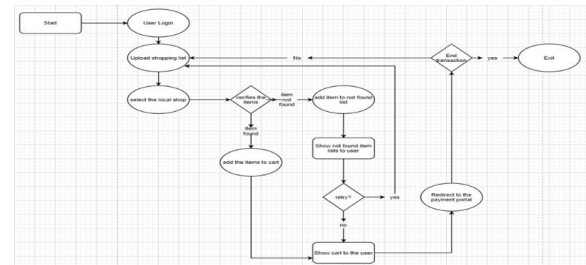
IMPLEMENTATION

SYSTEM REQUIREMENTS

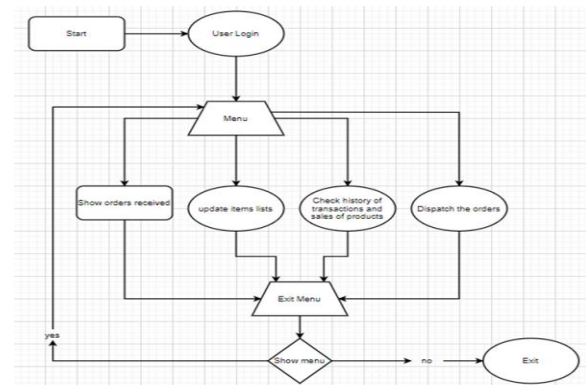
- Any device with active internet connection.
- Any modern web browser.
- Any mobile camera module (optional).

WORKFLOW DIAGRAMS

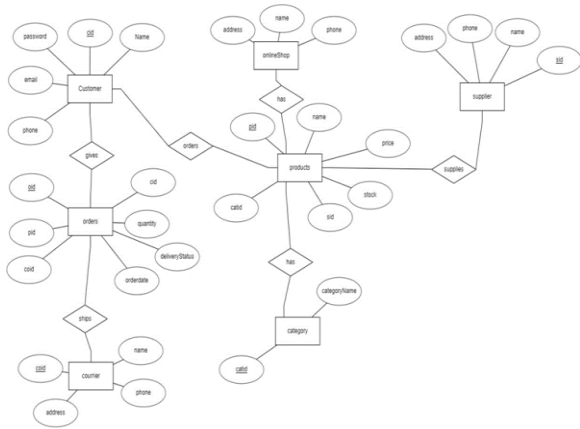
USER FLOW CHART



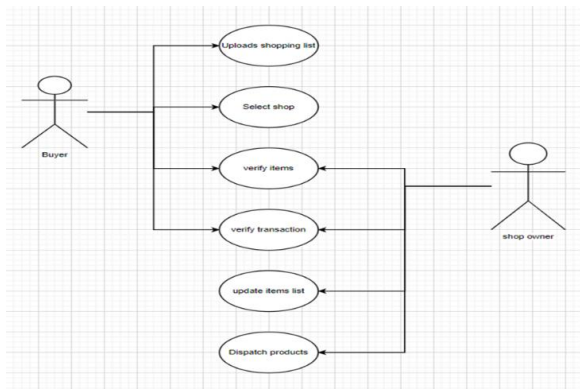
SHOP OWNER FLOW CHART



ER-DIAGRAM



USE-CASE DIAGRAM



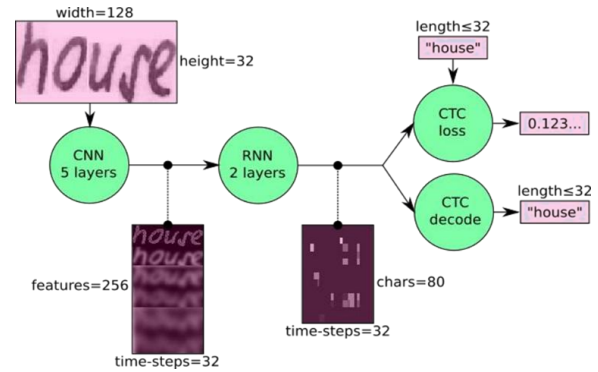
MACHINE LEARNING ALGORITHM DESCRIPTION

The back-end machine learning implementation only depends on numpy, cv2 and tensor flow imports. It consists of 5 CNN layers, 2 RNN (LSTM) layers and the CTC loss and decoding layer. The illustration below gives an overview of the NN (green: operations, pink: data flowing through NN) and here follows a short description:

- The input image is a grey-value image and has a size of 128x32.
- 5 CNN layers map the input image to a feature sequence of size 32x256.
- 2 LSTM layers with 256 units propagate information through the sequence and map the sequence to a matrix of size 32x80. Each matrix-element represents a score for one of the 80 characters at one of the 32 time-steps.
- The CTC layer either calculates the loss value given the matrix and the ground-truth text (when

training), or it decodes the matrix to the final text with best path decoding or beam search decoding (when inferring).

- Batch size is set to 50.



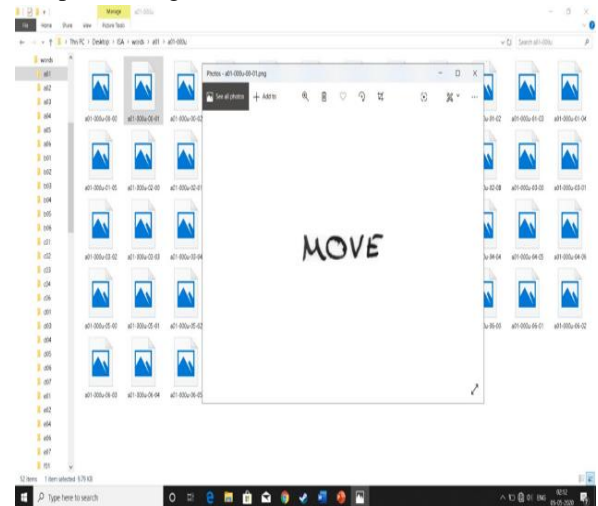
DATASET FOR THE MACHINE LEARNING ALGORITHM

Dir structure looks like this:

```

data
--test.png
--words.txt
--words
----a01
-----a01-000u
-----a01-000u-00-00.png
-----...
-----...
----a02
-----...
    
```

Sample of Images in the Data Sets



CONCLUSION

In this paper, we have created a simple web based shopping system which provides the shoppers and the shop owners a platform to buy and sell groceries from their local market without going out. This system helps users to reduce the efforts of adding each item individually to the cart and purchasing them.

They can easily click a picture of the shopping list and upload it to the web interface. The server then processes the image and generates a list of items that are present in the list and then it adds those items to the shopping cart. The user can then verify the items and proceed to the payment portal. This reduces the time and efforts of the user by at least 40%.

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