

Smart Shopping Cart using CNN

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Abstract—According to present scenario, now a days it is often observed during shopping groceries, vegetables, fruits and other needs in malls, markets, bazaars etc. There is a huge rush, billing of the cart products will be delayed due to more number of customers standing in queues at every bill counter especially on holidays and weekends. This leads to loss of valuable time of customers. To overcome these kind of situations, a simple solution is introduced that is “Smart Shopping Cart” using Convolution Neural Network (CNN). This smart cart is connected to cameras that are connected to webpage through hot spot which acts as a sensor, which sense the image of the products and process that image, the model processes the image only if the product is trained, tested and stored in the database. After processing the product image it identifies the product and add the product to the bill. To add the product to the bill we have used a high level pre-trained API known as Tensor flow which acts as a communication link between the sensor and webpage. If the product is removed from the cart then the product will be removed from the bill list. By implementing this model we can save the time of both seller and consumer and avoid misuse of billings.

I. INTRODUCTION

In India, the number of internet users has almost doubled in the past six years. This turned out to be an advantage for scientists, as many students were able to continue their studies. It also allows online exams, introducing the concept of online supervision at an academic level. Supervised exams allow. Manually monitoring a remote online exam is a difficult task because it is not possible to supervise many students monitors students using webcams and microphones. This system allows teachers track any abuse. This is engage in fraudulent practices. The purpose of remote monitoring software is to monitor students while they take an exam. As a result, computer algorithms have evolved to identify students who cheat. Access to student cameras is exercised, then monitoring them to detect proctor allows test takers to take the test from anywhere. Supervised testing the test anywhere. It should be reliable enough and connected to the Internet. online monitoring system will allow you to easily detect motion and sound. It should be reliable enough and connected to the Internet.

II. LITERATURE REVIEW

Modern technology era in which most customers have to wait in supermarket to shop as it is a time consuming process. Huge crowds in supermarkets during discount offers or weekends make it difficult to wait in long queues due to the barcode based checkout process. In this regard, we provide a smart shopping cart based on a DEPARTMENT NETWORK which consists of a camera that captures an image of the product and sends it to a pre-trained model, LCD display and application / mobile site 6. Product information will be stored in the

database. Then each 2 product information will show up in the mobile app/website. Customers can easily manage their shopping list on the Mobile app/website according to their preferences. The purchase information is then sent to the wireless server and automatically generates a invoice. In this era of rapid development, technological innovation is evolving with exponential speed. Many companies invest in developments that guarantee satisfaction at all stages of the consumer. One of the most popular developments in the is customer service technology that promises powerful new systems for buyers. A shopping cart, also known as a shopping cart, is a temporary means of transporting goods before cash withdrawal. The carriage has had limited modifications companies have researched and notified of promotions and product placements from the touch screen. In addition, the barcode scanner will scan the purchased item when the customer places it in the cart and the invoice amount will show on the touch screen. customers will only have to pay based on the amount shown to the cashier without having to wait in long lines to check in. The mentioned shopping cart enhancement can save customers x shopping time, but it requires the customer to navigate manually goal customers to experience so the need for an autonomous shopping cart and artificial intelligence is inevitable. In traditional purchasing, a designated person bills the customer's product at checkout, which involves scanning the barcode of each product and generating an invoice upon completion.

A. Disadvantages of Existing System

1. Time consuming
2. Labour intensive
3. Risk of errors
4. Misuse of personal data

III. PROPOSED SYSTEM

This paper proposes to improve modern technologies by combining Machine Learning (ML), Deep Learning (DL), Artificial Intelligence (AI), etc. We have implemented the following methods in model That is,

1. Open CV: - Open source computer vision library includes a wide range of algorithms, using these algorithms it detects transitions. motion of objects.
2. Tensor Flow:- Tensor Flow is an Open Source framework developed to run ML, DL, and other predictive and statistical analysis workloads.
3. Kera's:- Kera's is an API
4. .Squeeze net: - It is an 18 layers deep convolution neural networks. We were able to load a pre-trained version of the network trained on over a million images from the Image Net database.
5. Image AI (2.1.6); - An open source Python library designed to allow developers to build applications and systems with automatic deep learning and computer vision capabilities using a few simple lines of code.
HTML, CSS: - HTML (Hypertext Mark up Language) and CSS (Cascading Styling Sheets) are used to design and develop sample interfaces.
6. These methods are used to implement shopping carts to facilitate queuing in shopping Mart. So here are the conclusions below

A. Advantages of the Proposed System

1. Improved and safer shopping experience.
2. The product information will be stored in the database .
3. The individual product information will then be displayed on the mobile app/website.
4. clients easily manage shopping lists on mobile apps/websites

IV. METHODOLOGY

The provided shopping cart includes a camera that captures an image of the product and sends it to the pre-made template LCD display, and mobile app/website. The product information will be stored in the database . The individual product information will then be displayed on the mobile app/website. customers easily manage their shopping list on the mobile app/website according to their preferences. The purchase information is then sent to a wireless server and automatically generates a invoice.

V. SYSTEM REQUIREMENTS

Software & Hardware the it machines including from previous life. Here we have used below specification system for development. To be used effectively, any computer requires some hardware components and software resources on the computer. These prerequisites are known as system requirements (IT) and are often used as guidelines.

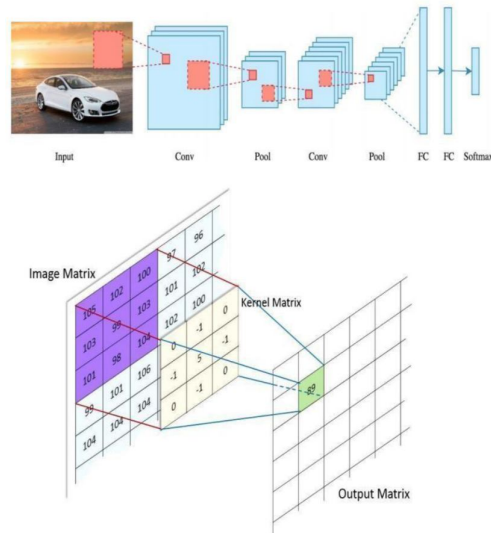


Figure 1: System Methodology

VI. SYSTEM DESIGN

In this phase, a logical system is built which fulfil the given requirements, design phase of software development deals with transforming the client's requirement into logically working system CONVOLUTIONAL NEURAL NETWORK In 2012, computer vision took a quantum leap when a group of researchers from the University of Toronto developed an AI model that surpassed the best image recognition algorithms and that too by a large margin. In deep learning, a convolution neural network (CNN/Conv Net) is a class of deep neural networks, most 8 commonly applied to analyze visual imagery. convolution is a mathematical operation on two functions. It uses a special technique called Convolution. 9 (f and g) that produces a third function ($f * g$) that expresses how the shape of one is modified by the other.

HOW WILL IT DETECT :

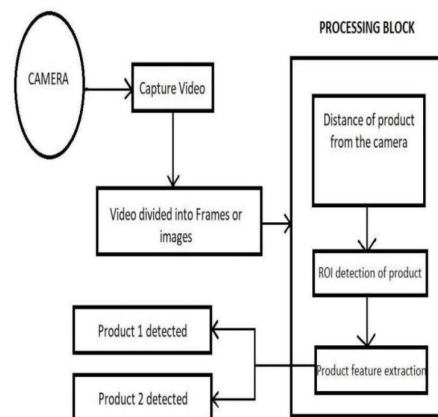


Figure 2: System Design

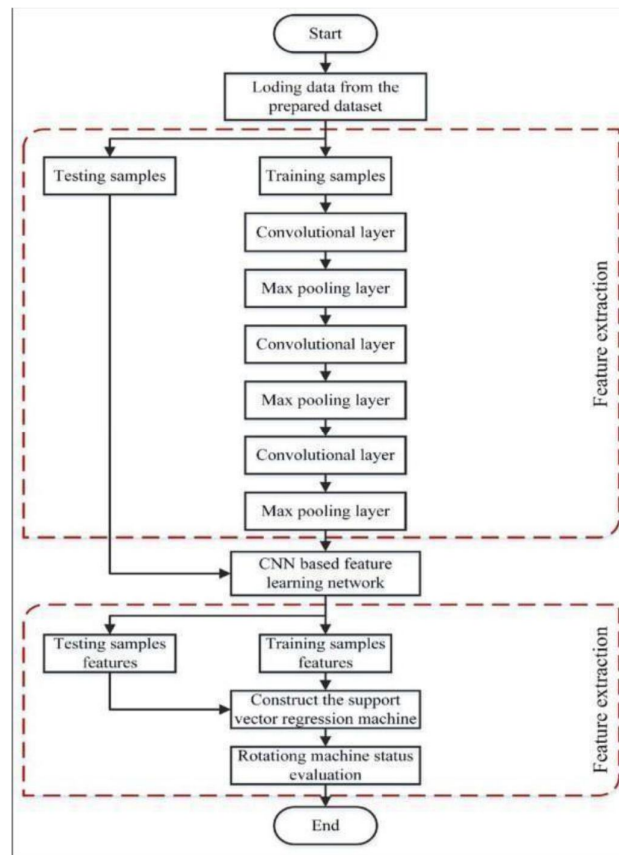
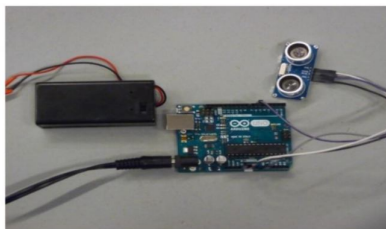


Figure 3: CNN Flow chart

VII. RESULTS AND DISCUSSION

The convolution neural network method for our projects is found better than any other neural net work.



Transmitter Tag



Overview of Smart Shopping Cart

Figure 4: Overview of Smart shopping cart

VIII. CONCLUSION

This paper describes about smart and efficient way of shopping. will not only detect and identify the product but also generate bill.

REFERENCES

- [1] P. Viola and M. Jones, "Rapid object detection using a boosted cascade of simple features," CVPR 2001, vol.
- [2] S. Ren, K. He, R. Girshick, and J. Sun, "Faster R-CNN: Towards real-time object detection with area proposal networks," in Proc. Adv. Neural Inf. Process. Syst., 2015.
- [3] R. Girshick, "Fast r-CNN," in Proceedings of the IEEE international conference on computer vision, 2015. Developed and maintained by Moses Olafenwa and John Olafenwa, brothers, creators of TorchFusion, Authors of introduction to Deep
- [4] Computer Vision and creators of DeepStack AI Server, 2020 .
- [5] T. Kohtsuka, T. Onozato, H. Tamura, S. Katayama, and Y. Kambayashi, "Design of a Control System for Robot Shopping Carts," in Knowledge Based and Intelligent Information and Engineering Systems. vol. 6881, A. König,
- [6] A. Dengel, K. Hinkelmann, K. Kise, R. Howlett, and L. Jain, Eds., ed: Springer Berlin Heidelberg, 2011, pp. 280-288.
- [7] D. Schulz, W. Burgard, D. Fox, and A. B. Cremers, "Tracking multiple moving objects with a mobile robot," in Computer Vision and Pattern Recognition, 2001. CVPR 2001. Proceedings of the 2001 IEEE Computer Society Conference on, 2001, pp. I-371-I-377 vol.1.
- [8] M. Bigos, J. Doiron-LaRue, R. Mui, E. Wu. (2011). Final Project Report: Cart-A-Long.
- [9] Suryaprasad J, Praveen Kumar B O, Roopa D & Arjun A K, " A Novel Low-Cost Intelligent Shopping Cart," IEEE, 2014.
- [10] Komal Ambekar, Vinayak Dhole, Supriya Sharma, "Smart Shopping Trolley Using RFID," International Journal of Advanced Research in Computer Engineering & Technology Volume 4 Issue 10, 2015