

ARTIFICIAL NEURAL NETWORK AND MACHINE LEARNING BASED SECURED PUBLIC RATION DISTRIBUTION SYSTEM

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Abstract - The Government of India supplies essential commodities for everyday use like food grains rice, wheat etc. To a large number of people by an elaborate machinery called Public Ration Distribution System (PRDS). This system currently works on manual processes which is time consuming and even inaccurate sometimes. To automate PRDS, this project proposes a novel system called Smart Automated Ration Distribution System (SARDS) which replaces the manual processes in PRDS. In this system, conventional quota card will be replaced by a Face Recognition system to detect the faces using artificial neural network algorithm to identify the ration card holder. Here, the user needs to show the face in front of camera to detect his/her face. Faces of authenticated users (ration card holders) will be pre-stored in the database which is then used as reference to compare with the faces that is being detected while requesting for the distribution of ration material in order to check whether the person is authenticated user or not. If user is found to be authentic then monthly quota of the ration available for the user is displayed. Then based on the ration materials are distributed by using motor. Thus, our system provides the materials automatically without help of humans. This system, when deployed in actual field, is expected to be operational 24x7 and ensure safe, secure, fast and corruption-free distribution of Ration commodities to the general public.

Key Words: PyCharm Software 1, Nano Microcontroller 2, Driver Board 3, Web Camera 4, Gear Motor 5.

1. INTRODUCTION

Public distribution scheme is a structure promoted by government and includes chain of shops. This scheme aims to provide food grains and commodities to people at affordable price. Public distribution scheme ails at many factors such as availability, overcharge, Tim in, undersupply illegal smuggling of goods and corruption. Intelligent Public Ration Distribution System (IPRDS) is similar to an Automated Vending Machine which allows customers to complete purchases and transactions of basic ration commodities with ease. The customer identification, distribution of commodities, billing and data updating etc.

are automated. The customer identification is done by face recognition (HCA). The system was prototyped and tested to distribute ration materials automatically without the presence of any shopkeeper. The proposed scheme can be directly implemented in the existing ration shops and thereby reduce the labor works associated with distribution of commodities. Since all the activities will be monitored by the food supplies department, all activities take place in accordance with the rules and regulations. whether the person's detected face is present in the database and can get the materials or if the face is not matched with any of the faces in the pre-stored dataset, the person cannot get the materials and it will also be displayed in the display as no access or access denied. Servo motor is used to distribute the ration materials to the person who have access after being recognized as a person in database by matching his/her face with the faces in the database. Thus, our system reduces the man-power and also avoid the forges that may happen while distributing the commodities like cheating in weighing, false statement about the availability of goods, and so on. It also saves time in a greater extent which is a great problem in ration shops where people have to wait for long time to get the supplies. So, this automated system will supply materials fatly and thereby, it reduces the burden of people who have to stand in long queues to buy the materials.

2. EXISTING METHOD

In this existing ration distribution system, the Ration Card brought by the customer is verified by the shopkeeper and there by the materials are manually measured and supplied. It has a user interface with a keypad as input and LCD display as output. The customer has to provide his/her fingerprint to access the system. Once the fingerprint is authenticated, the system provides materials. The quantity of commodities available to the specific customer is displayed on the LCD display.

3. PROPOSED SYSTEM

The Smart ration vending machine system uses Face Recognition. The first is for capturing and creating a database by storing the image. And is to compare the image with the stored images in the database. For feature extraction we used Artificial neural network algorithm for

recognition of the face. This proposed system uses Here Cascades classifier as a face detection. Firstly, the algorithm needs a lot of positive images and negative images to train the cascades classifier. Positive images are images with clear faces where negative images are those without any faces. System architecture consists of train dataset with consumer faces. Captured consumer face is compared with the face stored in the dataset. If captured face match with the face stored in the dataset, then hardware system activates and provide quantity of grains. This proposed system Faces will be verified with family members for authentication of the user. This system will require very fewer human efforts for operation and is also very secure. Every neuron is connected with other neuron through a connection link. Every association interface is related with a weight that has data about the information signal. This is the most helpful data for neurons to tackle a specific issue on the grounds that the weight normally energizes or hinders the sign that is being imparted. Every neuron has an interior state, which is called an actuation signal.

4. BLOCK DIAGRAM

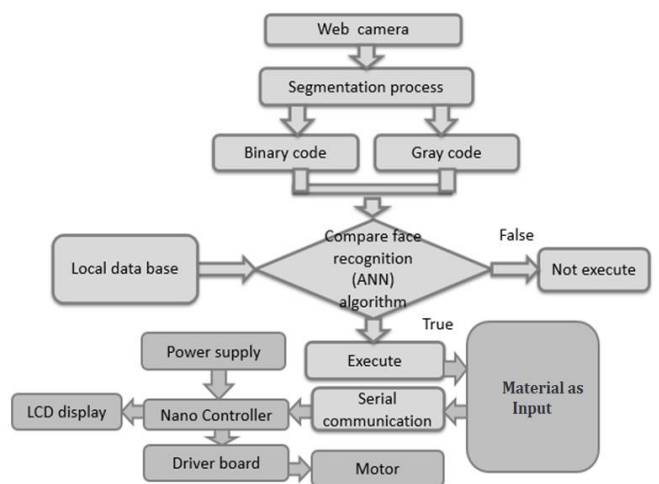


Fig 1: Block Diagram

The nano board is planned so that it is exceptionally simple for amateurs to begin with microcontrollers. This board particularly is breadboard cordial is extremely simple to deal with the associations. Smash (articulated slam) is an abbreviation for Random Access Memory, a sort of PC memory that can be gotten to arbitrarily; that is, any byte of memory can be gotten to without contacting the former bytes. Smash is found in workers, PCs, tablets, cell phones and different gadgets, like printers. DRAM (Dynamic Random-Access Memory) – The term dynamic shows that the memory should be continually invigorated or it will lose its substance. Measure is regularly utilized for the principal memory in registering gadgets. In the event that a PC or cell phone is promoted as having 4GB RAM or 16GB RAM, those numbers allude to the DRAM, or fundamental memory, in the

gadget. All the more explicitly, the vast majority of the DRAM utilized in current frameworks is coordinated DRAM, or SDRAM. Makers likewise now and again utilize the abbreviation DDR (or DDR2, DDR3, DDR4, and so on) to depict the sort of SDRAM utilized by a PC or worker. DDR represents twofold information rate, and it alludes to how much information the memory can move in one clock cycle. All in all, the more RAM a gadget has, the quicker it will perform. SRAM (Static Random-Access Memory) – While DRAM is ordinarily utilized for primary memory, today SRAM is all the more regularly utilized for framework reserve. SRAM is supposed to be static since it shouldn't be invigorated, not normal for dynamic RAM, which should be revived huge number of times each second. Thus, SRAM is quicker than DRAM. Nonetheless, the two kinds of RAM are unstable, implying that they lose their substance when the force is killed. PyCharm is the most mainstream IDE utilized for Python scripting language. This section will give you a prologue to PyCharm and clarifies its highlights.

5. EXPERIMENTAL OUTPUT

This Project will help the people to get all the groceries without forgery by the vendor and also the details can be seen whenever the officer's need. This system will require very fewer human efforts for operation and is also very secure. The Materials details can also be seen by the both Customer and Vendor in LCD Display.



Fig 2: Experimental Kit

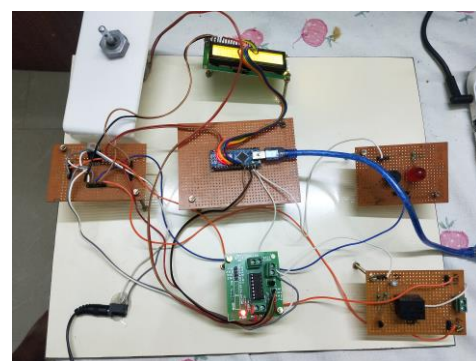


Fig 3: PyCharm Analyzing Database

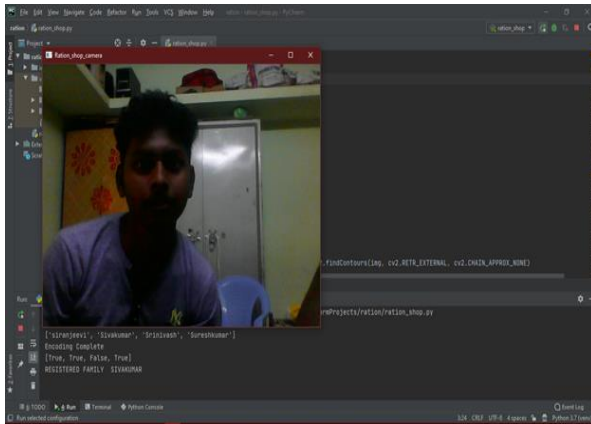


Fig 4: Output

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6. CONCLUSIONS

This project brings out a new venture to ensure full-fledged and transparent Ration Distribution system. The data updating and processing is made easy using the proposed system and hence saves a lot of paper work time. Any further extension to the existing model can also be deployed. Since, security aspects like face identification is used in this system, the Ration Distribution system is made highly secured. Though the system has to incur initial investment costs, the long-term benefits overshadow it. Through transparency in all transactions, corruptions can be eliminated to an extent. Further, the system can be made to work as a distribution of ration material by using motor.

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