



SMART VOTING MACHINE BASED ON FINGER PRINT AND FACE RECOGNITION

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Abstract: The Smart Voting System is highly secured and involves verification of voters at 2 levels. It illustrates the hardware and software aspects of the project. The voting machine will be able to take in finger prints and eye image as inputs and will recognize it using the trained model. The vote cast by recognized inputs becomes a valid vote and the unrecognized input becomes an invalid vote. Such a system of two step verification makes voting process transparent. Here we are considering 3 nominated candidates. 4 to 50 people can vote. Candidates should get enrolled before Voting. During election authorized Voters are allowed vote, unauthorized candidate are not allowed.

Index Terms - Detection, Recognition, Haar Cascade.

I. INTRODUCTION

Electronic Democratic is the standard method for leading decisions utilizing Electronic Democratic Machines. Generally, voting forms were utilized. A polling form might be a basic piece of paper in which every citizen composes the name of the competitor or stepping against the name of their ideal up-and-comer. So the voter casts their ballot in a box at a polling station. It required ballots to be printed, which is very time-consuming and inefficient. There was no way to audit the system unless we manually recount the votes and also it is susceptible to damage. In few places, where the governance is corrupt, they can easily insert several fake votes in the ballot and then it becomes impossible to track the honest votes. So in paper ballot system time, security and valuable records are at stake. Then, at that point, comes Electronic Democratic Machine. The Electronic Democratic Machine turned into the swap for the paper voting form, which is currently the backbone in the electing system. Electronic Democratic Machine comprises of two units. One is Control unit and another is Voting form unit with a link for interfacing the both. As of late Citizen Recognizable Paper Review Preliminary is appended with the Electronic Democratic Machine that permits the electors to confirm that their votes are given a role as expected. At the point when a vote is projected, a slip is printed containing name, image of the up-and-comer, this slip is printed gets consequently cut and falls in fixed box. In the ongoing framework, the control unit is worked by surveying corner official. The official affirms the elector's recognizable proof then, at that point, electronically enacts the polling form unit to acknowledge another vote. So there could be no legitimate component by which the citizen can check their character prior to making the choice because of which counterfeit electors can project various phony votes. For example, where the Elector and Citizen ID would be away yet at the same time the vote will be projected by another person. This is many times done when individuals who are mindful to check the confuse get compromised or get under impact or strain. So the Electronic Democratic Machine utilizing Unique finger impression confirmation and Face acknowledgment will turn into the best answer for casting a ballot. Here we are utilizing organic qualities and contrasting this information and a biometric referred to information which had been put away during learning system of the model.

1.2 SCOPE OF THE PROJECT: The aim of this project is to authenticate the voter's identity by Finger Print and Face Recognition using image processing. This would be a powerful tool for the Election system. The algorithm for model training and matching concentrate on automated detection of voter's fingerprint and Face.

1.3 METHODOLOGY • The working of the project involves hardware and software.

- Hardware includes the peripheral device that takes in the physical world input.
- The embedded device(microprocessor) which accumulates the input data, processes it and gives out the output.
- Collecting data from a central database. This data set is used to train a model.
- The second aspect is deploying the model into the microprocessor.
- The model gives the prediction and accuracy percentage. Depending upon the accuracy percentage the model predicts true or false.

- LCD will display the verified Voter ID, if true otherwise it will display Invalid Voter.

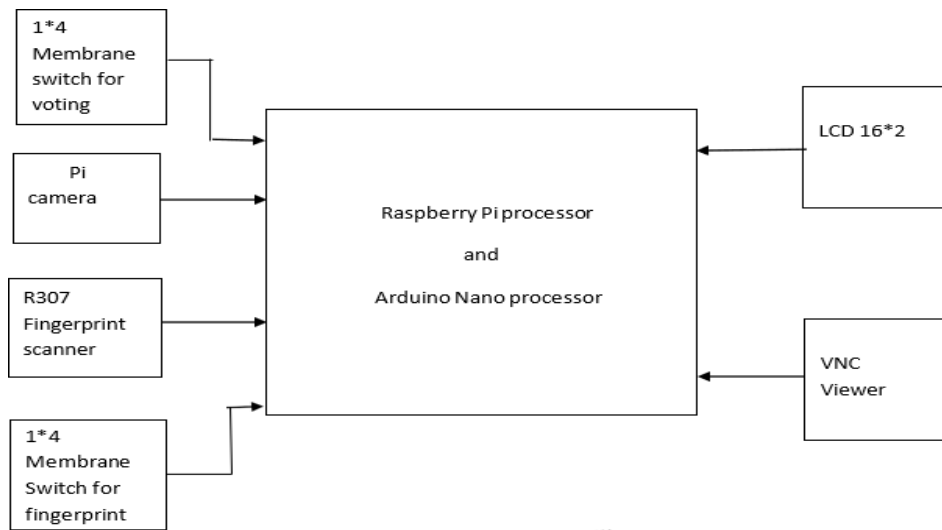


Fig.1.1: Block diagram

II. RELATED WORK

1. Secure and Hassle Free EVM through deep learning face recognition -Author: Ishani Mandal

Overview -In the paper, the face recognition based on the features extracted by a conventional neural network from the captured image of a voter. If the captured images features match with those existing images stored in the database, the result is considered as positive and the voter is asked to cast vote for a political party. Once the vote has been cast, all the facial alignment details pertaining to the voter gets deleted from the system, so that if the same voter comes for voting, the system detects the maliciousness and prevents it instantly.

Drawback -In the above paper they have used CNN for the identification of voter. If the images contain some degree of tilt or rotation then CNNs usually have difficulty in classifying the image.

2. Dual Authentication Voting System Author: Sidharth Sabat, Rahul Kadwe, Dayanand Apake, Shubham Pawar. Overview • The essential thought of this paper is connected with an electronic democratic machine that will assist with destroying swindling of the manual democratic frameworks. • A double confirmation framework utilizing a RFID tag and a finger impression based framework is utilized. The subtleties of the citizen will be recovered from the recently selected information and put away in the miniature regulator. • First RFID tag is confirmed with the enlisted data of miniature regulator and afterward finger impression scanner is utilized to check regardless of whether the elector is unique. Assuming the information coordinates with the generally put away data, the data is shown on the LCD show and the citizen is permitted to make his choice. On the off chance that the citizen isn't signed up for the framework or on the other hand in the event that the unique mark doesn't coordinate with the data then a message is shown on LCD show as "ACCESS DENIED", and security caution will ring to illuminate the surveying official's and the individual isn't permitted to survey his vote.

Drawback • In the above paper they have used RFID tags to verify the enrolled information but we are not using RFID because the RF gives RFID its strength. but is also its weakness, and also one of the disadvantage. RFID can only work if there's enough RF signal strength because RF carries the information between reader and tag.

3. Implementation of Biometric Voting Machine Using Aadhar Card Author: Gowri, Guruprasanth, Jaya Surya D, Krishnan.S, Dhanasekaran.S.

Overview • This paper addresses the issue of phony democratic. It is an implanted framework. • It includes unique finger impression selecting and coordinating. At first, the ward individuals need to enlist the unique mark in the finger impression scanner. • Then, at that point, during political decision, the client, who needs to survey his vote, needs to punch the finger in finger impression scanner at the counter at the surveying stall. In view of unique mark distinguishes the character of client is advised by LCD. The client's unique mark in view of Aadhar Card is now saved in data set of framework

Drawback • The existing system have lack of security since they are using only one verification process.

III. EXISTING SYSTEM

Electronic Democratic Machine (otherwise called EVM) is casting a ballot utilizing electronic means to one or the other guide or deal with the errands of projecting and counting votes. An EVM is planned with two units: the control unit and the balloting unit. These units are consolidated by a link. The control unit of the EVM is kept with the managing official or the survey in official. The ballot in unit is saved inside the democratic compartment for voters to project their votes. This is finished to guarantee that the surveying official confirms your personality. With the EVM, rather than giving a polling form paper, the survey in official will press the Polling form Button which empowers the elector to make their choice. A rundown of competitor's names or potentially images will be accessible on the machine with a blue button close to it. The citizen can press the button close to the up-and-comer's name they wish to decide in favor of contrasts this information and the generally existing information put away during the enrollment of the electors for confirmation. On the off chance that the information coordinates with the put away data of the enlisted finger impression and Face, the individual is permitted to make his choice. On the off chance that not, an admonition message is shown on LCD and cautions through the voice by along these lines, the individual is banished from surveying his vote. The vote projecting instrument.



Fig.2.1:ElectronicVotingMachine

PROBLEMS WITH EXISTING SYSTEM • Since the Electronic Democratic Machine travel through various hands they are defenseless to controls by fake. Wasteful course of personality checking: Here legitimate electors are simply checked by surveying officials by their photographs on the citizen card in this manner pretty much comparable looking people can give the decision for the benefit of another.

IV REQUIRED COMPONENTS -The Raspberry Pi is a PC that runs Linux, which is more affordable. It likewise gives a bunch of GPIO (universally useful information/yield) pins, permitting you to control electronic parts for actual figuring and investigate the Web of Things (IoT).

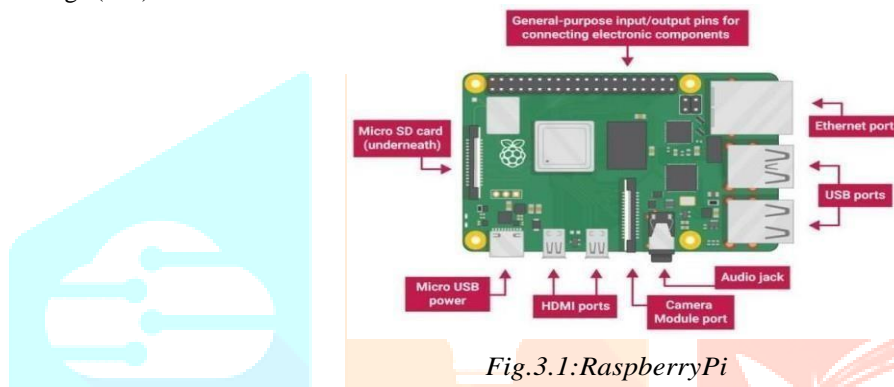


Fig.3.1:RaspberryPi

Raspbian working framework is the free and open source working framework which Debian based and advanced for Raspberry Pi. It gives the essential arrangement of projects and utilities for working Raspberry Pi. It accompanies around 35,000 bundles which are ordered programming's that are packaged in a pleasant configuration for hustle free establishment on Raspberry Pi. It has great local area of designers which runs the conversation frames and gives answers for some pertinent issues.

Specification: • SoCBroadcomBCM2711,quad-coreCortex-A72(ARMv8)64-bitat1.5GHz • SDRAM4GBLPDDR4-2400 WirelessLAN2.4GHzand5.0 GHz IEEE802.11b/g/n/ac, Bluetooth5.0 • True Giga bit Ethernet • USB3.0ports,2 USB2.0ports • Fully backward compatible 40-pin GPIO connector • HDMI micro ports supporting video resolution up to 4K60Hz • 2-way MIPIDSI/CSI ports for camera and display • Slot for Micro SD card, for operating system and data storage • Requires 5.1V,3Apower supply via USB-Cor GPIO • PoE (Power over Ethernet) enabled (requires Po EHAT)

R307 Finger print Sensor: Raspbian working framework is the free and open source working framework which Debian based and advanced for Raspberry Pi. It gives the essential arrangement of projects and utilities for working Raspberry Pi. It accompanies around 35,000 bundles which are ordered programming's that are packaged in a pleasant configuration for hustle free establishment on Raspberry Pi. It has great local area of designers which runs the conversation frames and gives answers for some pertinent issues.



Fig.3.2: R307 Finger print Sensor

Specification: • Current Consumption:≤75mA • Operating Voltage: 4.2-6VDC • VerificationSpeed:0.2sec • ScanningSpeed:0.3sec.False Acceptance Rate:≤0.0001% .False Rejection rate:≤0.1% • Sensor Resolution:500DPI • Template size:512bytes • Operating Temperature:-20-+50°C

Pi Camera: Superior quality camera module viable with all Raspberry Pi models. Gives high responsiveness, low crosstalk and low commotion picture catch in a tiny and light weight plan. The camera module associates with the Raspberry Pi board by means of the CSI connector planned explicitly for interacting to cameras. The CSI transport is prepared to do very high information rates, and it only conveys pixel information to the processor.

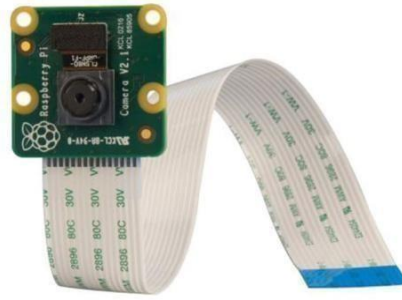


Fig.3.3: Pi Camera

Specification: • Picture Sensor Sony IMX 219 PQ CMOS picture sensor in a fixed-center module. • Still picture goal 3280 x 2464 • Max picture move rate 1080p: 30fps (encode and unravel) 720p:60fps • Association with Raspberry Pi 15-pin lace link, to the committed 15-pin MIPI Camera Sequential Point of interaction (CSI-2) • Aspects 23.86 x 25 x 9mm
Temp range Operating: -20° to 60°C Stable image:-20° to 60°C • Resolution 8- mega pixel • Lenssize1/4” • Weight 3g

LCD (Liquid Crystal Display): LCD is a kind of level board show which involves fluid gems in its essential type of activity. Fluid gems don't transmit light straightforwardly, rather utilizing a backdrop illumination or reflector to deliver pictures in variety or monochrome. LCDs are accessible to show erratic or fixed images with uninformed substance, which can be shown or stowed away.

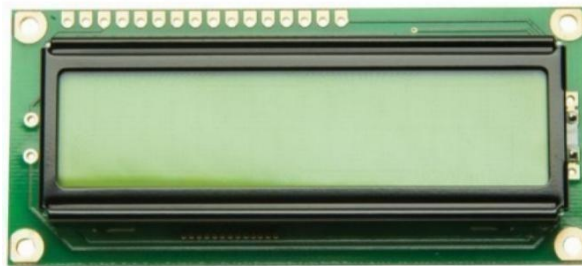
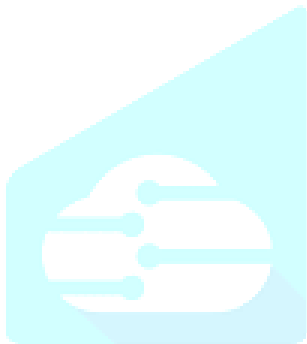


Fig.3.4:LCD

Specification: • The operating voltage of this display ranges from 4.7V to 5.3V • The display bezel is 72 x25mm • The operating current is 1mA without a backlight • HD47780 controller • LED color for backlight is green or blue • Number of columns– 16 • Number of rows – 2 • Number of LCD pins –16 • Characters–32
It work sin4-bit and 8-bit modes • Pixel box of each characteris5×8pixel • Font size of character is 0.125 Widthx0.200 height

Arduino Nano: Is an intelligent development board designed for building faster prototypes with the smallest dimension. Arduino Nano being the oldest member of the Nano family, provides enough interfaces for your breadboard-friendly applications. At the heart of the board is ATmega328 microcontroller clock data frequency of 16MHz featuring more or less the same functionalities as the Arduino Duemilanove. The board offers 22 digital input/output pins,8analog pins, and a mini- USB port