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Aadhaar Based Advanced Security System Based on Machine Learning using K210 Processor

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ABSTRACT: The rise of technology into India has brought into force for many type of equipment that aims at more security. ATM is one such machine which made money transaction easy for customers to the bank and bank locker also plays a major role in providing security to the customer's resources. ATM and bank locker has both advantages and disadvantages. Biometric technology is fast gaining technology in terms of security measures to reduce cases of fraud and theft due to its use of physical characteristics and traits for the identification of individuals. The earliest methods of biometric identification includes fingerprint and handwriting and more recent ones include eye/iris scan, face scan, voice print and hand print. In TM and bank locker, the existing mode of security system is a CCTV camera and a manpower. This security system takes more time in identifying the theft action. Our proposed system aims at instant identification of the crime actions done by using face and biometric recognition(Aadhaar database). When ever ATM or bank locker is physically disturbed by any person, it immediately captures the person's image and compare with the Aadhaar database and instantly, send images with their personal details to the nearby police station through message, call and email.

KEYWORDS: Facial Recognition, Machine Learning, Biometric Recognition, K210 Processor, Aadhaar Database, Advanced Security

I. INTRODUCTION

The facial recognition system is an algorithm used to identify a person's identity and then verify it using the captured images and compare them with the image of the face stored in the database, this system is often used in security systems and is used in other areas like schools, government sectors, and airports and other areas that need an easy, fast and reliable system. The emergence of face detection algorithms began in the early nineties, face detection has many challenges, therefore the task of face detection algorithms is to search in all parts of the given image, taking into account differences, for example, the size and skin colour. In this research paper we have done a survey of Face Recognition[1]. In recent years, with the demand for better security, computers have played a large role. Due to their precision, large memory banks and high computing power, considerable development has been made in the area of face recognition. Computers now surpass humans in many face recognitions tasks. A human being can remember limited number of faces. But a computer doesn't have any limits, and can hence be used where large databases of facial records are needed. Such a facial recognition system has many potential applications including crowd and airport surveillance, private security and improved human-computer interactions[2]. In this paper, Deep Learning method is introduced with as a part of learning, based strategy to provide a complete analysis about the face samples present in the system. It also improves the performance of the LDRC by keeping the track of history information about the faces arriving as an input. The experimental results acquired on YALE and ORL database shows that the proposed system performs well than the early methods of LRC algorithms. The visible general problems in face recognition are fraudulent faces and the factors affecting recognition accuracy such as noise, diversions in the angle, poses and expression[3].

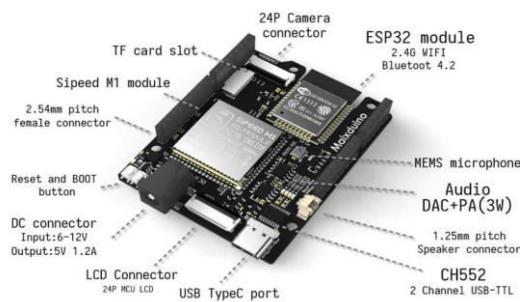
The research reported in this paper addresses some of the critical challenges of face recognition under adverse conditions. In this context, we introduce an end-to-end framework for real-time video-based face recognition. This system detects, tracks and recognizes individuals from live video feed. The proposed system addresses three key challenges of video-based face recognition systems: end-to-end computational complexity, in the wild recognition and multi-person recognition[4]. While recognizing any individual, the most important attribute is face. It serves as an individual identity of everyone and therefore face recognition helps in authenticating any person’s identity using his personal characteristics. The whole procedure for authenticating any face data is sub-divided into two phases, in the first phase, the face detection is done quickly except for those cases in which the object is placed quite far, followed by this the second phase is initiated in which the face is recognized as an individual[5]. A real-time monitoring system for ATM security based on accelerometer sensor, camera module, and fingerprint module is proposed. The proposed work concludes with the following points. It is a secure way of accessing an ATM by authorized persons using face recognition module. Eliminates the drawback of previous system like manual controlling camera modules and doors the system is cost effective as compare to existing manual technique[6].

II. PROPOSED SYSTEM

We proposed a new system to identify the thief while robbery occurring in the ATM. Our system will intimate the police department while robbery occurring through call, E-mail and SMS. Our system will capture the thief person’s image and it will compare it with previous data base and it will pass the mail along with thief’s personal details and images. Nowadays, ATM plays an important role in every one’s life to make transaction of their money. But we can see there is a security issues in ATM. Many illegal activities occur in the ATM (Money robbery). Even security guard in the ATM machine, getting murdered while some robbery occurred. And the public and police department will come to know only after robbery occurred in the ATM. This security system takes more time in identifying the theft action. Our proposed system aims at instant identification of the crime actions done by using face and biometric recognition (Aadhaar database). Whenever ATM or bank locker is physically disturbed by any person, it immediately captures the person’s image and compare with Aadhaar database and instantly, send images with their personal details to the nearby police station through message, call and email.

III. EXPERIMENTATION AND METHODOLOGY:

3.1 HARDWARE TOOLS:



K210 PROCESSOR



GSM 800 MODULE



ESP32 CAMERA

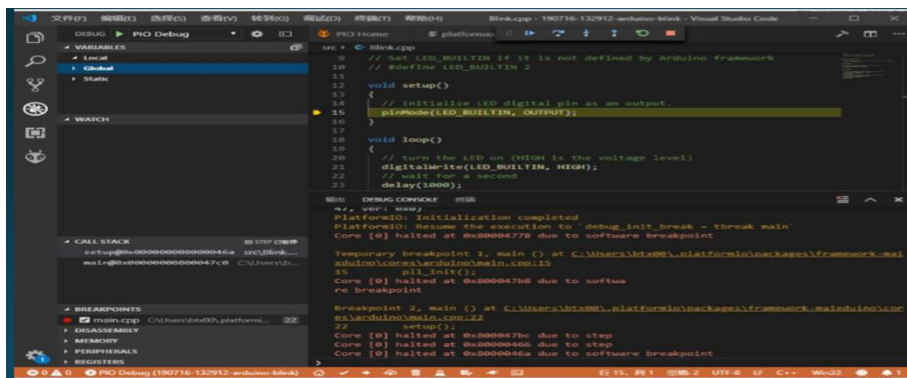
3.2 SOFTWARE TOOLS:

- Coding Language: Python

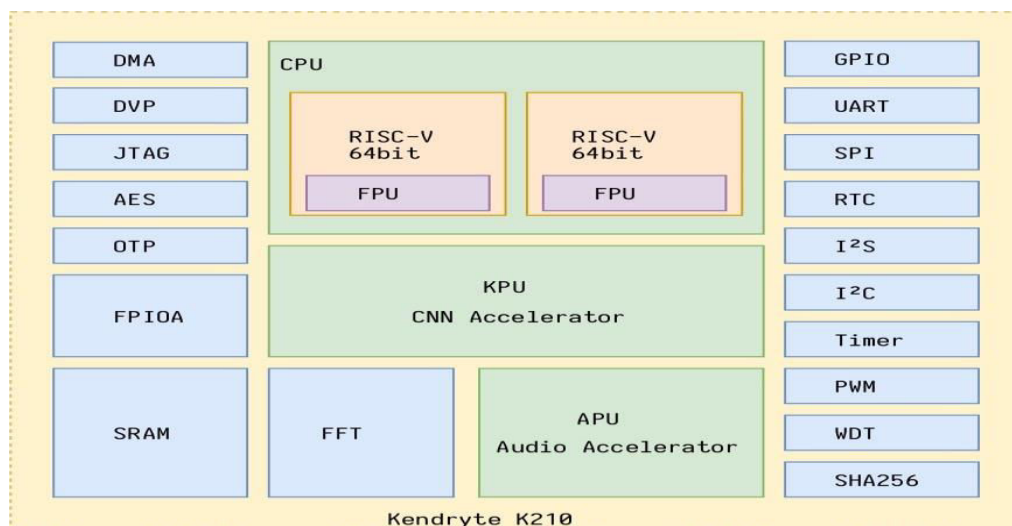
Micro python is a streamlined and efficient implementation of the python 3 programming language, including a small portion of the python standard library, mainly running on embedded chips with limited performance and memory (such as STM 32). Noted that Micro python does not include all the syntax of python 3. MaixPy is a project to port Micro python to the K210 .It also supports MCU regular operations and integrates modules such as machine vision and microphone arrays to quickly develop smart applications especially AI projects.

USING PLATFORM IO IDE:

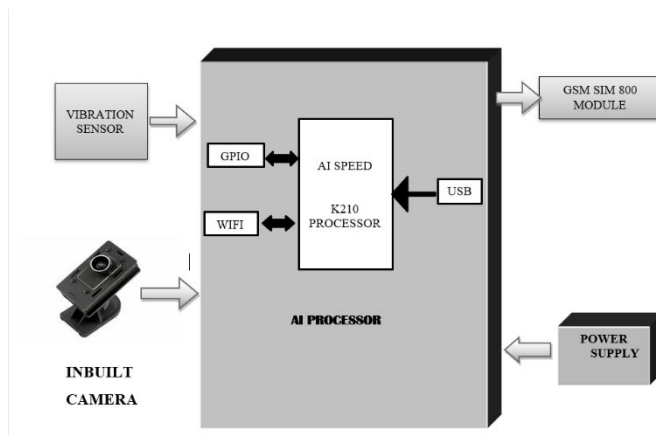
- We can get more powerful support through using platform IO IDE



3.3 ARCHITECTURE OF K210 PROCESSOR:

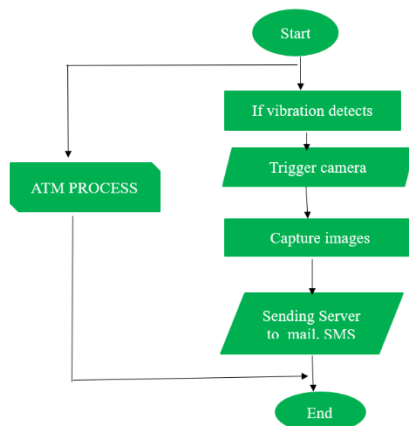


IV. BLOCK DIAGRAM



TheKendryte K210 which is launched in September 2020 is a system-on-chip (SoC) that integrates machine vision and machine hearing. It is dual- core 64-bit processors for better power efficiency, stability and reliability.The mainapplication field of this chip is in the field of Internet of Things. Maixduino Artificial Intelligence with IOT K210. The ESP32 Development Kit is based on the K210 RISC-V AI processor MaixduinoArtificial Intelligence development board and comes with an MI AI module and ESP32 module for WI-Fi and Bluetooth connectivity in Arduino UNO forms factor. The K210 kit includes a dual-processor chip with anindependent FPU, 64-bits CPU bit width, 8MB on-chip SRAM, 400 adjustable nominal frequency and double-precision FPU. K210 processor is connected with GSM 800 Module; Vibration Sensor;and camera.Externally power supply is given to the k210 processor and camera ESP32is mainly for bluetooth as well as wifi connectivity.

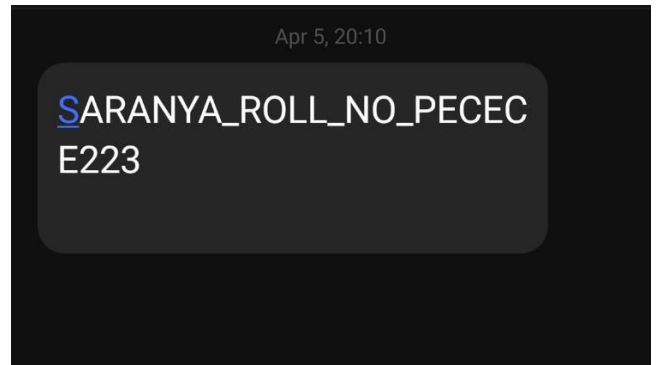
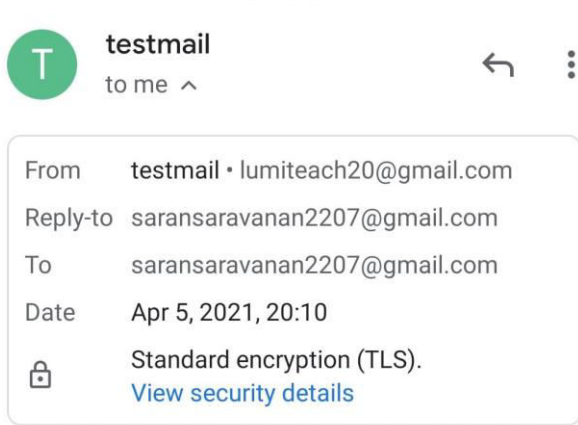
V. FLOW CHART



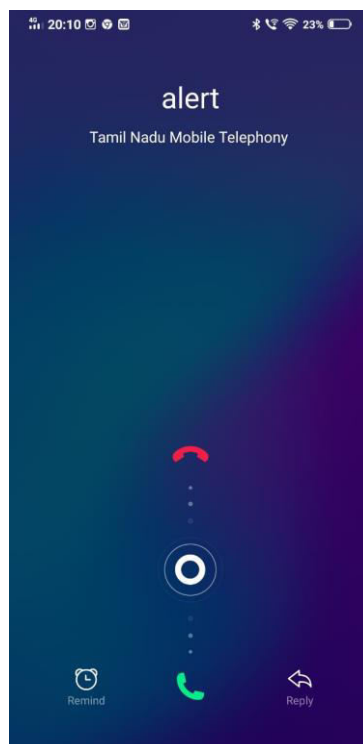
This flow chart explains that, the ATM system will start to function as normal, when high vibration greater than the preferred level is not detected. If a high vibration is detected, it will trigger the camera to switch on. Then, the camera will capture the images in front of the ATM. The captured images will be compared with the Aadhaar database and the details of a particular person will be sent through message, mail and also alerted through the call. And, the system stops the process.

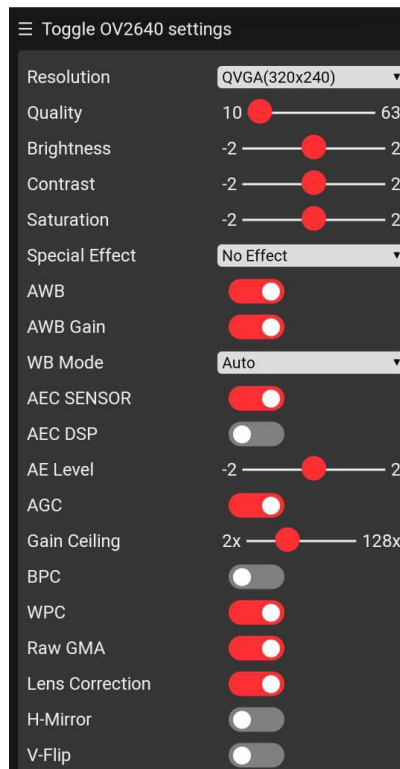
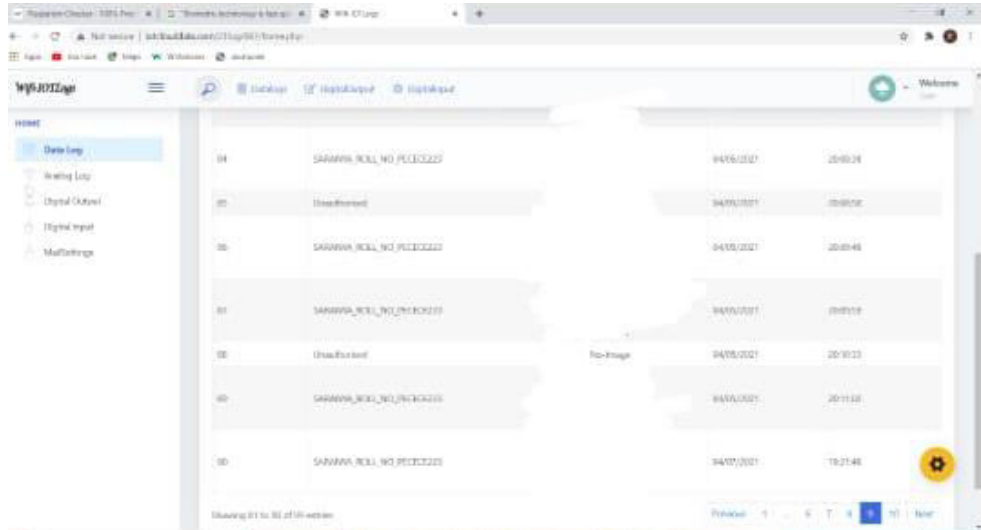


VI. RESULTS



SARANYA_ROLL_NO_PECECE223<http://iotclouddata.com/21log/087/page1.php>





192.168.43.138(IP address)



VII. CONCLUSION

In this project, our main aim is about providing Security in ATM by making use of Aadhaar scheme where the robbery of money from ATM can be reduced to some extent which would be helpful for the public. Keeping the existing security problem in our mind, we have developed a solution which would help in instant identification of the crime and also it consumes less time in fetching thief details from the Aadhaar database in real time implementation. This makes us to have more security in public place. We proposed a system with facial recognition system. Since, we are not having access to Aadhaar database. But, in future for high security level, the government can implement by using iris scanner in order to match with the iris biometric of the Aadhaar database.

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