

Development of Arduino based E-FIR Registering Machine

Himanshu Arora*¹, Puneet Sharma¹, Rameshwar Cambow^{#1}, P Naga Sai Vivek², Varsha Yadav², Sandeep Singh²

¹Assistant Professor, Mechanical Engineering, Lovely Professional University, Phagwara, Punjab, India

²Research Scholar, Mechanical Engineering, Lovely Professional University, Phagwara, Punjab, India

ABSTRACT

A great many people fear setting off to the police headquarters when a wrongdoing happens. There is normally an inclination that enlisting a grievance is a monotonous procedure or the police won't be agreeable. In any case, that shouldn't prevent anyone from making a move against a wrongdoing. At the point you proceed towards the police headquarters, you are required to document a First Information Report (FIR) or a grievances. This report record the complainants' point of view on the wrongdoing submitted. FIR's can be held up by the individual against whom the offense is submitted, by the individual who realizes that the offense has been submitted, or by the individual who has seen the charging of an offense.

INTRODUCTION

It is a process in which any person can go on the internet and sign into the designated website and record a FIR. Therefore, along with a particular FIR number, he receives an acknowledgment receipt with date. The filing of a First Information Report (FIR) against any criminal offense is an essential right of every citizen under the Indian legal framework [1].

Recording a FIR is the underlying and most significant advance in looking for equity against any criminal offense. Every single resulting examination and lawful activities that pursue depends on the FIR held up at the police headquarters by the complainant. Other than this, the other explanation is debasement. Unskilled or semi-proficient residents who are unconscious of their principal rights are misused by degenerate police faculty who concentrate fixes from them just to enrol a FIR [2]. The sheer badgering looked by most residents, particularly ladies, at the hour of recording a FIR, is the essential explanation that numerous criminal offenses go unreported.

In the setting of the E-FIR any resident would now be able to sign in from anyplace in India and document an E-FIR [3]. This implies each resident would now be able to practice their crucial right in looking for equity against any criminal offense carried out against that person. This spares time, cash and the majority of all, is free of any provocation. At present, this office is accessible in the territory of Odisha yet different states are propelling the equivalent [4].

• How does the police profit from the E-FIR framework?

At each headquarters of the police the time committed to process the enrolling of a FIR for each case occupies a great deal of time and vitality of the staff present, as every complainant is normally joined by a few people, a large number of whom are unsettled and on occasion, rough. With most police headquarters being understaffed and overburdened with administrative work, fundamental open reaction and affability get disregarded, prompting individuals whining of police inconsiderateness and lack of care [5].

With a few staff engaged with the way toward documenting FIRs and in taking care of the enormous number of individuals present at the police headquarters, essential policing will in general endure. With a huge level of FIRs currently being recorded on the web, the police staff has been liberated of open weight which is thus prompting better FIR development and faster reaction to grumbings documented [6].

DESIGN AND IMPLEMENTATION

Designing an FIR assistance program is aimed at providing a forum such as ATM machines through which they can lodge their FIR directly using their Aadhar data. This system is based on the widely used ATmega2560 microcontroller in Arduino Mega [7]. The figure above shows a schematic view of the proposed support system for Smart FIR. This system is based on the widely used ATmega2560 microcontroller in Arduino Mega. We use serial communication on pin 50, 51 as TX, RX and provided 5V power supply and common ground to interface a R305 fingerprint module with microcontroller. In this model, fingerprint is

used to verify the identity of the user by taking his fingerprint and checking identified values in the program with the user.

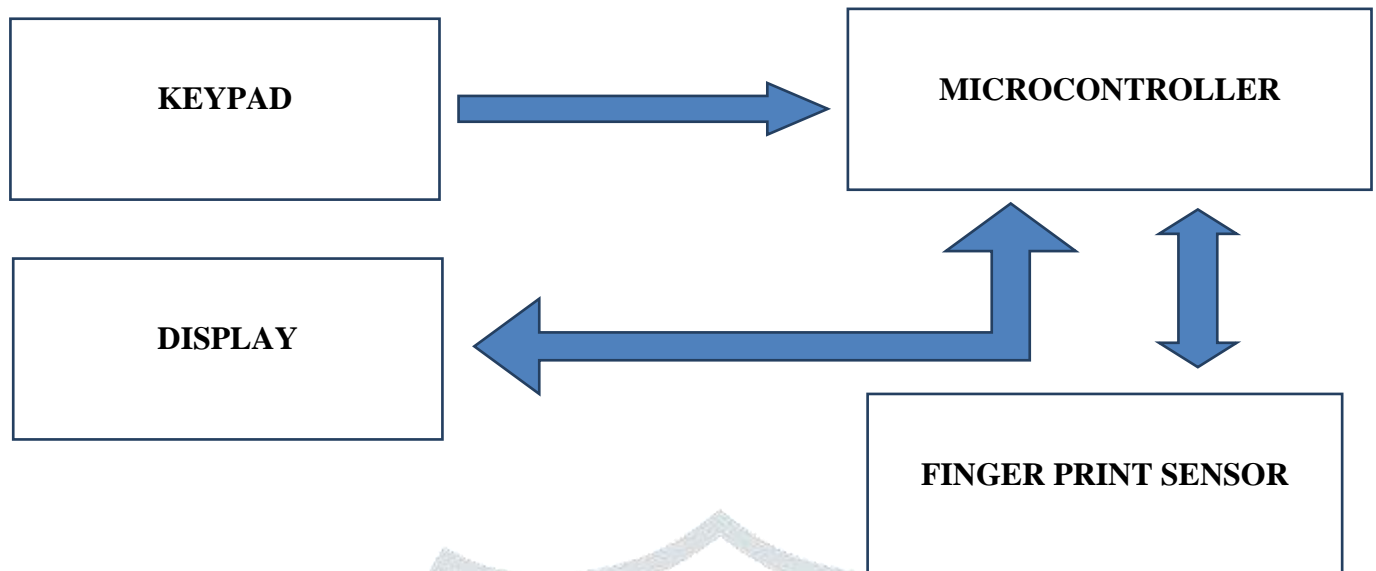


Figure 1: Architecture of the Proposed System

In this model, a 16X2 LCD is used to show the graphical interface and make it easier to use. It will show all the things and details that are important. The LCD uses an i2c module to make it easier. An i2c module is an IC with 4 connectors, i.e. SCK, GND, SDA and VCC the SDA pin is a serial clock that synchronizes the data between the controller and the LCD.

In this model, the 4X4 3 keypads are used and make a complete alphabetical keypad that the user uses to enter his choice. The 3 keypad rows made pin 4, 5, 6 and 7 popular and all columns linked to each digital input pin.

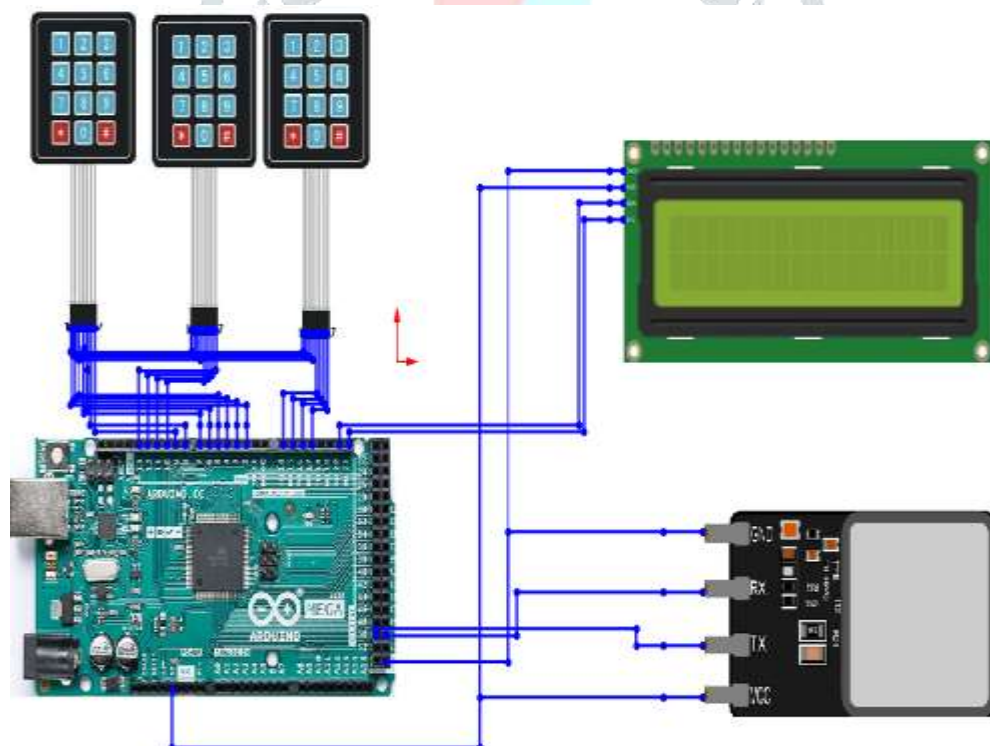


Figure 2: Block Diagram of FIR Assistance System

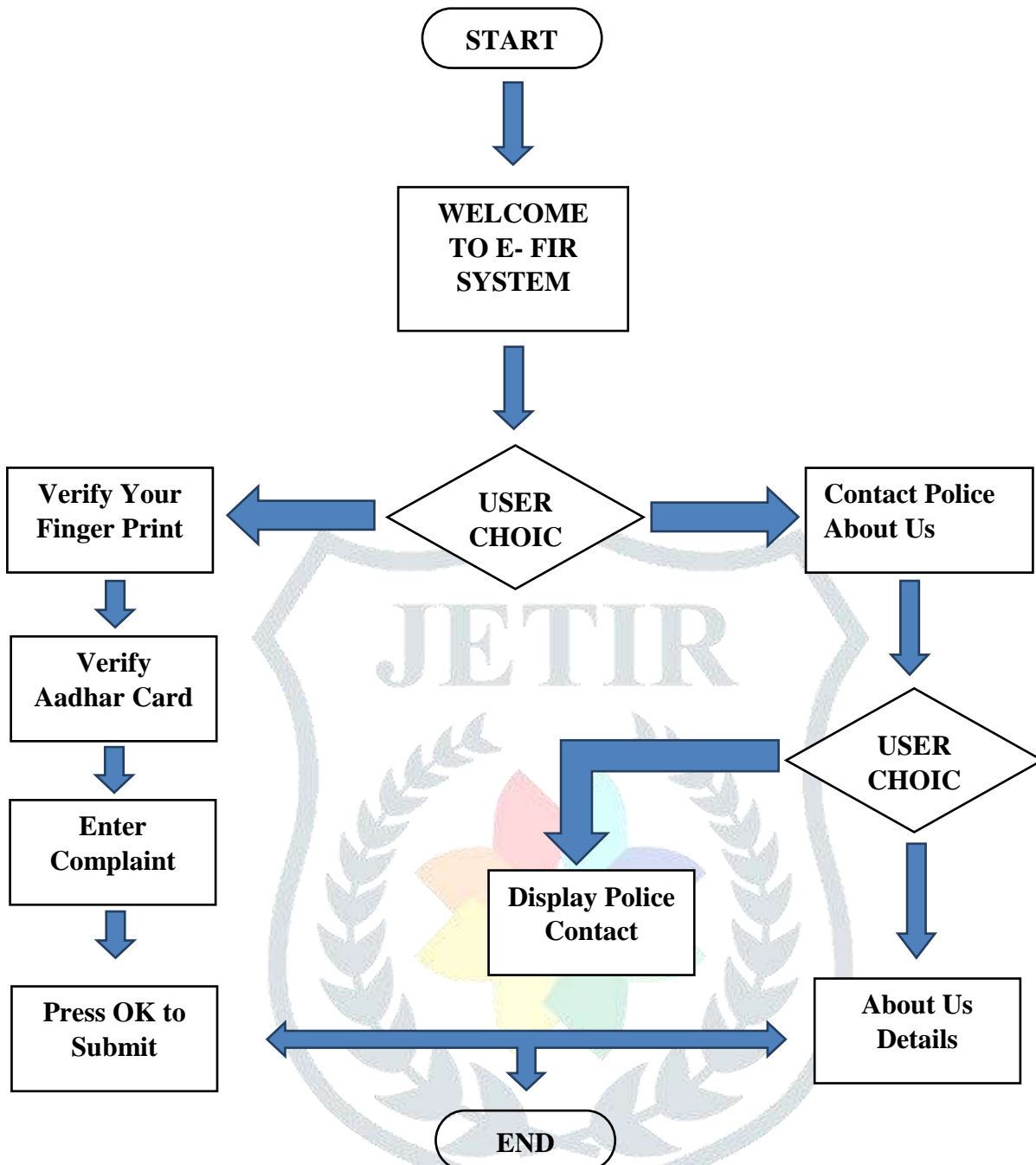


Figure 3: Flowchart of FIR assistance system

DESCRIPTION OF HARDWARE

- **Controller Arduino MEGA ADK**

It is a ATmega2560-based microcontroller. The digital input / output pins are 54 (15 for PWM output), 16 analog inputs, 4 hardware serial ports, 16 MHz oscillation unit, USB controller, power jack, ICSP and a reset button. This microcontroller consists of various communication services to connect with computer, other microcontrollers and microprocessors. An ATmega8U2 on the board channels one of them through USB and provides a virtual com port for computer software. When transmitting data via the ATmega8U2/16U2 chip and USB link to the device (but not for serial communication on pins 0 and 1), the RX and TX LEDs on the board will flash. The Arduino software involves a serial monitor that makes it possible to send simple textual data to and from the board. A serial device library allows serial communication on any of the virtual pins of the MEGA ADK [8].

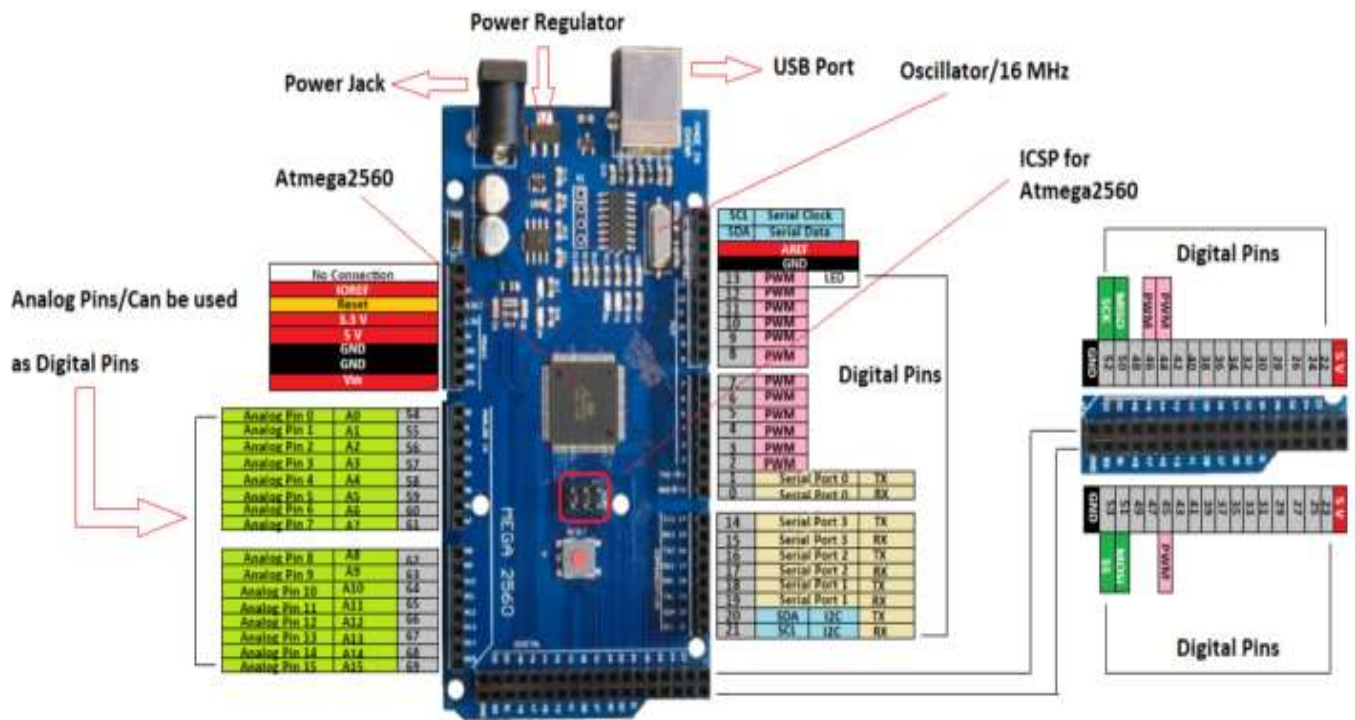


Figure 4: Pin Diagram of Arduino Mega

R 307 Fingerprint module

This is the sensor module for the R307 Optical Fingerprint Reader. The R307 fingerprint module is the TTL UART finger print sensor for direct access by means of the MAX232/USB Serial adapter to the UART microcontroller or the PC. In the client's module, fingerprint data can be saved and set to 1:1 or 1:N mode to recognize the person [9].



Figure 5: Back view of R307



Figure 6: Front view of R307

- **Liquid Crystal Display(16 X 2)**

In most embedded projects, LCD modules are very widely used because of their low cost, accessibility, and programming friendly. Many of us, either at PCO's or calculators, would have come across these screens in our day-to-day existence. The presentation and wiring diagrams already have been shown above, let's get a bit technical now [10].



Figure 8: 16x2 LCD display module

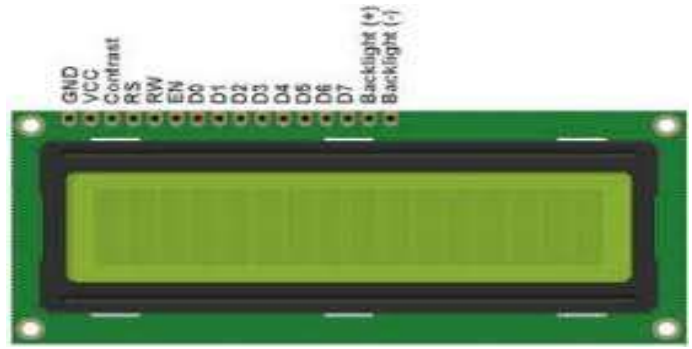


Figure 9: Pin of 16x2 LCD display module

DESCRIPTION OF SOFTWARE

- **Arduino IDE**

It is a design (open-source) platform based on operating systems that is easy to use. This consists of a programmable circuit board (known as a controller) and a ready-made device called Arduino IDE (Embedded Design Environment) that is used to create and send to the physical board the computer code. In the Arduino Software, Arduino programs are written.

RESULTS



Figure 10: Welcome Screen of the Project



Figure 11: Connecting to Server Database of police



Figure 12: Connected successfully with database



Figure 13: Select the option from the menu shown in screen. Note: if we press 1 i.e. Lodge Your FIR

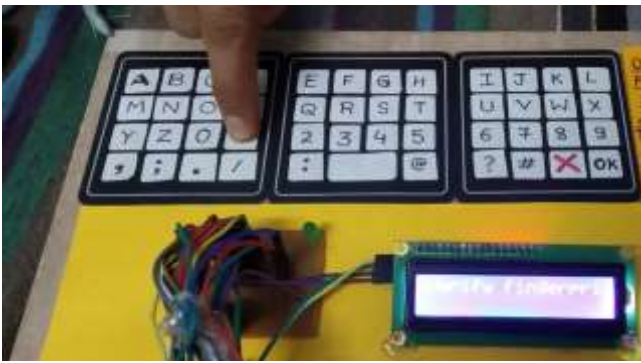


Figure 14: It ask to verify your fingerprint and keep the fingerprint on sensor



Figure 15: Detecting the fingerprint of the user



Figure 16: Enter the Aadhar No. after verifying the Fingerprint



Figure 17: Enter the complaint after verification



Figure 18: Press Ok to submit your FIR

CONCLUSION

The FIR support system is meant to perform a variety of features that can be clarified, allowing the user to file their grievance at anytime from anywhere. A verification module is being used to confirm an individual's identity before submitting their grievances, so no false FIR is filed via this platform. The system helps the public and also reduces the police department's workload, as most police stations were under staff and overloaded with paperwork. The system increases the system's level of transparency and encourages people to go to the police. This program would strengthen the judiciary and promote the filing of grievances by citizens. This platform can be installed in public spaces such as hospitals, banks, government departments, MNCs, etc., so it is easily available and useful to everyone.

References

- [1] <https://www.thebetterindia.com/45845/e-fir-india-complaint-delhi-police-bengaluru-madhya-pradesh-tamil-nadu-karnataka-himachal-pradesh/>
- [2] <https://www.mapsofindia.com/my-india/government/e-fir-system-to-fight-crimes>
- [3] <https://www.emeraldinsight.com/doi/abs/10.1108/JEIM-10-2012-0073>

[4] <https://dl.acm.org/citation.cfm?id=2757420>

[5] <https://www.arduino.cc/en/Main/ArduinoBoardMegaADK?from=Main.ArduinoBoardADK>

[6] <https://www.theengineeringprojects.com/2018/06/introduction-to-arduino-mega-2560.html>

[7] <http://www.circuitstoday.com/arduino-mega-pinout-schematics>

[8] <http://www.campuscomponent.com/buybulk/fingerprint-sensor---r307/1531>

[9] https://www.rhydolabz.com/miscellaneous-other-widgets-c-205_124/finger-print-sensor-r307-ttl-uart-p-2631.html

[10] L. Ceccaroni and X. Verdaguer. FIR system: multimedia, interactive services in city. In Proceedings of the Workshop on Crime and improvise Information Access - Working Conference on Advanced Visual Interfaces (AVI 2004), pages 10-21, New York, NY, USA, 2004. ACM press.

