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Finger print based license authentication scheme for Indian scenario: A Review

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ABSTRACT

Fingerprint authentication or recognition refers to the automated method of verifying a match between two human fingerprints. Fingerprints are one of many forms of biometrics used to identify individuals and verify their identity. The analysis of fingerprints for matching purposes generally requires the comparison of several features of the print pattern. In this project, we use the Finger print authentication scheme which is a non-imitable biometric authentication scheme. By using this biometric authentication, we can prevent the non-licensed person from driving. Our proposed system consists of a smart card capable of storing the finger print of a particular person. While issuing the license, the specific person's finger print is to be stored in the card. At the time that person's details are fully stored in that database. So at anywhere the person should place on his finger on the finger print reader. That person's entire information will be displaying.

INTRODUCTION

CURRENT SCENARIO

Even though the Aadhaar card has been made mandatory in 16 states and Union Territories, its penetration is limited. Only 30 crore people across the country have been issued the card "I had planned to drive down to Bhutan with my family a few years ago. At the border checkpoint at Phuntsholing, I flashed my PAN card as my proof of identity. The authorities there rejected it, saying that fake cards were in circulation. I had no other proof to establish my identity," says Nilaya Deep, a former top executive with Goldman Sachs in New York. Deep had left the US in 2007 to return to India.The Unique Identification Authority of India (UIDAI), which is implementing the Aadhaar project, lists a set of documents accepted as identity proof. These include passport, PAN card, ration/PDS card, voter identity card, driving license, government photo ID card, NREGS job card, photo ID issued by a 49azette49ed educational institution, arms license, photo bank ATM card, photo credit card, pensioner photo card, freedom-fighter photo card, kisan photo passbook, CGHS/ex-servicemen contributory health scheme card, and a certificate of identity with a photo issued by a Group-A 49azette officer on his letterhead. Too many identity cards can serve up a crisis. And they are, for a multitude of options has made establishing one's identity confusing. Does one flash the Aadhaar card, PAN card, driving licence, or the passport? Or, is enrolment in the National Population Register (NPR) the proof of being an Indian? The average Indian grapples with the problem every day. Migrants to the Capital find it difficult to even open bank accounts.

Even though Aadhaar has been made mandatory in 16 states and Union Territories, its penetration is limited – only 30 crore people have been issued the card across the country. The NPR remains a non-starter. For the non-salaried

class, getting a PAN card remains a challenge. And not too many Indians have passports. So, how do they establish their identity?

TAMIL NADU GIVES ITS DRIVERS A LICENCE TO KILL:-
Tamil Nadu records more fatal accidents than any other state, but drivers who claim lives are almost inevitably back at the wheel in no time. The number of licences cancelled or suspended for drunk driving or causing fatal road accidents dropped dramatically in the past four years despite a huge increase in the number of people dying in accidents each year.

As many as 12,784 people died in 11,813 road accidents in 2008 but the authorities cancelled the licences of only 358 reckless drivers. A total of 15,422 people died in accidents between April 2011 and March 2012, but the authorities cancelled a piffling 178 licences.

The transport department and the police have also shown alarming laxity while dealing with drunk driving, cancelling fewer licences than ever before. There was an 80% drop in licences revoked for driving or riding under the influence of alcohol, from 1,356 in 2008 to 275 last year. The State Crime Records Bureau does not even record accidents caused due to drunken driving. Transport department officials say the police have to set the ball rolling for them to take action against drivers. "We can cancel licences only if the police recommends that we take action in cases of fatal accidents and drunken driving," a senior official said.

APPLICANTS NEEDN'T EVEN KNOW THE TRAFFIC RULES OR ROAD SIGNS:-Says an RTO employee: "It is enough to show your skills on the side of a road or on a piece of vacant land where tests are usually conducted. Applicants for a two-wheeler licence need do no more than describe an eight' on the road. Skills such as tackling sudden crossings, overtaking other vehicles, taking U turns and maintaining lane discipline and road safety are not acquired. These can be tested only on testing tracks."

Around 60,000 people in Tamil Nadu, including 10,000 in Chennai, get driving licences every month.

Officials of the Transport Department say conducting a driving test in city like Chennai is a big challenge due to shortage of adequate land for it. Insufficient motor vehicle inspectors is another problem.

"Ideally, driving should be practised on a driving range and tests conducted on a testing track. Here, driving ranges exist only in Taramani in Chennai and Gummidipoondi and all applicants cannot be taken there," said an official.

"Till 1978, when the police issued licences, testing tracks with traffic signals and signages were available at the old office of the traffic police on Poonamallee High Road. Such full-fledged testing tracks should be set up in all RTOs and a proper system evolved so that the driving tests can be more strict," says Santhanakrishnan, a road safety activist in Perambur.

BLOCK DIAGRAM

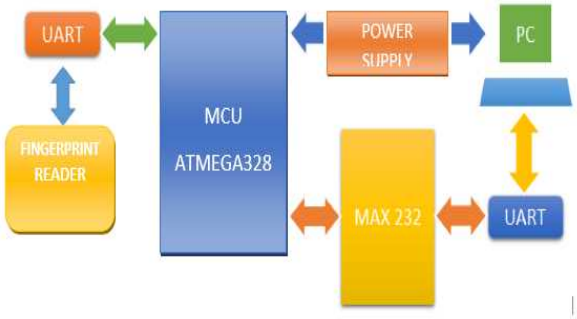

FIG: 1 BLOCK DIAGRAM

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a

computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter.

Fingerprint processing includes two parts: fingerprint enrollment and fingerprint matching (the matching can be 1:1 or 1:N). When enrolling, user needs to enter the finger two times. The system will process the two time finger images, generate a template of the finger based on processing results and store the template. When matching, user enters the finger through optical sensor and system will generate a template of the finger and compare it with templates of the finger library. For 1:1 matching, system will compare the live finger with specific template designated in the Module; for 1:N matching, or searching, system will search the whole finger library for the matching finger. In both circumstances, system will return the matching result, success or failure. The mode is semi-duplex asychronism serial communication. And the default baud rate is 57600bps. User may set the baud rate in 9600～115200bps. Transferring frame format is 10 bit: the low-level starting bit, 8-bit data with the LSB first, and an ending bit. There is no check bit. The Atmega328P is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the Atmega328P achieves throughputs approaching 1 MIPS per MHz allowing the system designer to optimize power consumption versus processing speed.

This is a finger print sensor module with TTL UART interface for direct connections to microcontroller UART or to PC through MAX232 / USB-Serial adapter. The user can store the finger print data in the module and can configure it in 1:1 or 1: N mode for identifying the person. The FP module can directly interface with 3v3 or 5v Microcontroller. A level converter (like MAX232) is required for interfacing with PC serial port. Optical biometric fingerprint reader with great features and can be embedded into a variety of end products, such as: access control, attendance, safety deposit box, car door locks.

Via serial interface, the Module may communicate with MCU of 3.3V or 5V power: TD (pin 2 of P1) connects with RXD (receiving pin of MCU), RD (pin 3 of P1) connects with TXD (transferring pin of MCU). Should the upper computer (PC) be in RS-232 mode, please add level converting circuit, like MAX232, between the Module and PC. The MAX232 is an IC, first created in 1987 by Maxim Integrated Products, that converts signals from an RS-232 serial port to signals suitable for use in TTL compatible digital logic circuits.

The MAX232 is a dual driver/receiver and typically converts the RX, TX, CTS and RTS signals. The drivers provide RS-232 voltage level outputs (pprox.. ± 7.5 V) from a single + 5 V supply via on-chip charge pumps and external capacitors. This makes it useful for implementing RS-232 in devices that otherwise do not need any voltages outside the 0 V to + 5 V range, as power supply design does not need to be made more complicated just for driving the RS-232 in this case. The receivers reduce RS-232 inputs (which may be as high as ± 25 V), to standard 5 V TTL levels. These receivers have a typical threshold of 1.3 V, and a typical hysteresis of 0.5 V. The later MAX232A is backwards compatible with the original MAX232 but may operate at higher baud rates and can use smaller external capacitors – 0.1 Mf in place of the 1.0 Mf capacitors used with the original device. The newer MAX3232 is also backwards compatible, but operates at a broader voltage range, from 3 to 5.5 V. Desktop and some old Laptops have Serial port which comes in DB9 package. In Most of the Circuits designer is concerned about the Tx and Rx pins only so the function of the rest of the pins are not used here mostly.

In the circuit only one Driver is used and second driver can be used for other purpose. TTL data is available on pin 12 and pin 11 and these pins can be attached to Microcontroller or any system which accept TTL logic. Software used are Arduino UNO, Proteus(Simulation), Fingerprint reader module, Visual Basic.

OUTPUTS:-

REGISTERED VEHICLES

For registered vehicles the result will show the Certificate of Registration and Certificate of Insurance of the particular person.

FIG: 2 REGISTERED VEHICLES

LICENSED PERSON

For a person having valid license the system will show the output as the person's driving license and its details.

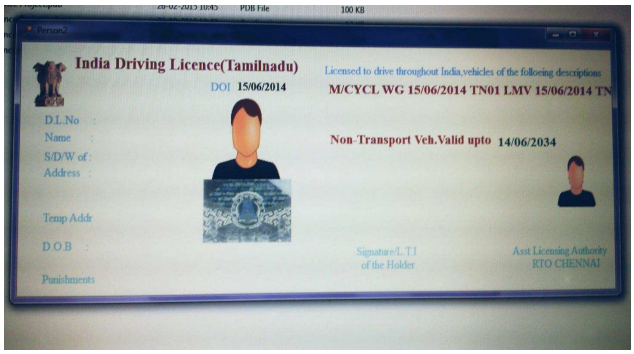

FIG: 3 LICENSED PERSON

UNREGISTERED VEHICLES

The unregistered vehicles will have an output showing unregistered vehicle number.

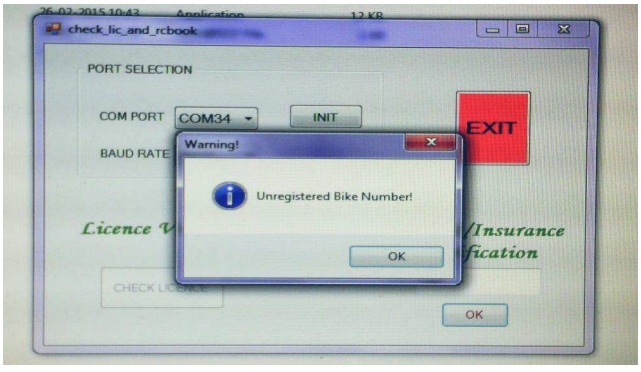

FIG: 4 UNREGISTERED VEHICLES

NON-LICENSED PERSON

The person not having license will have an output showing that the person doesn't have license.

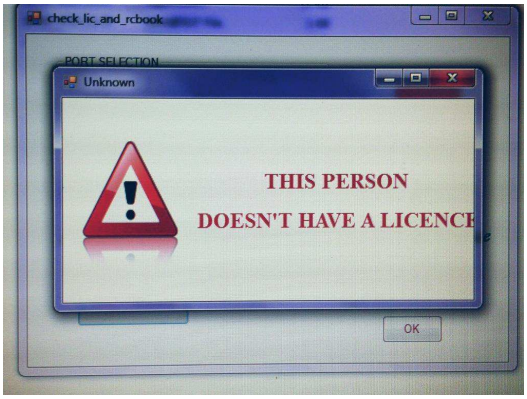

FIG: 5 NON LICENSED PERSON

CONCLUSION

Using fingerprint based licensing and authentication technique it will be easy to find out the non-licensee and preventing them from driving illegally. Finger print authentication scheme which is a non-imitable biometric authentication scheme. While issuing the license, the specific person's finger print is to be stored in the card. At the time that person's details are fully stored in that database. So at anywhere the person should place on his finger on the finger print reader. That person's entire information will be displaying. Hence our project fulfills to catch the non-licensed person and their vehicles from driving, to identify the fake users, it helps to identify the unregistered vehicles, it also helps licensed person from paying fine, sometimes if they kept their license at home. Finally, a fingerprint based licensing authentication scheme is achieved by maintain the simplicity for future application.

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