

# Secured Banking using Multilevel Authentication by Face Recognition and SIM Card Verification for ATMs



S. Mahaboob Basha, V. Ramkumar, S. P. Vijaya Vardan Reddy, V. Bhuvaneshwari, V. Praveen Kumar

**Abstract:** Security in ATM centers has become the need of the hour. Now-a-days we hear lots of news about Money laundering from ATMs by using fraudulent cards. This incurs not only loss of money but also huge stress to the customers. To thwart this situation and to guarantee a secured and safe transaction we have proposed a multilevel authentication for allowing access to the customer's account. In our prototype the first level of authentication through the SIM of the subscriber. If it is a valid SIM then the second level of security check is through Facial Recognition. The camera in the ATM unit captures the image of the person withdrawing the money and compares with the database in the bank's server. If both are matching then access to the net banking is facilitated. We are also incorporating voice annunciator system to aid blind people which will guide them to perform the transaction with ease.

**Keywords :** SIM Card verification, Facial Recognition, Voice Annunciator.

## I. INTRODUCTION

### 1.1 ATM

An Automated Teller Machine (ATM) or the Automatic Banking Machine (ABM) is a Plastic smartcard with a built in chip. Within the chip there will be a unique Identification number that is used to validate the Genuinely of account number. If it is a valid card then the card holder is allowed to do the transactions after entering a four digit code called PIN (Personal Identification Number). Using ATM not only money can be withdrawn but also payment for purchases can be done directly through the ATM machines available in the shops. Online purchase can be done by using the debit/credit card number and valid PIN number.

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\* Correspondence Author

**Dr. S. Mahaboob Basha\***, Assistant Professor, R.M.K. Engineering College, Chennai, Tamil Nadu, India,

**Mr. V. Ramkumar**, Assistant Professor, R.M.K. Engineering College, Chennai, Tamil Nadu, India,

**Mr. S. P. Vijaya Vardan Reddy**, Assistant Professor, R.M.K. Engineering College, Chennai, Tamil Nadu, India,

**Ms. V. Bhuvaneshwari**, Assistant Professor, SRM Institute of Science and Technology, Chennai, Tamil Nadu, India,

**Mr. V. Praveen Kumar**, Senior Engineer, Nagman Instrumentation and Electronics Pvt.Ltd, Chennai, TamilNadu, India.

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The invention of ATM reduced the risk of carrying huge sums of money everywhere. There is also lot of risks involved if we lose our cards. New Technologies are evolving to provide a secured cashless banking. The various synonyms of ATM are Automated Transaction Machine, Cash Point (in Britain), Automated Banking Machine, Money Machine, Bank Machine, Cash Machine, hole-in-the-wall, Any Time Money (in India). Banc mat (in various countries like Europe and Russia), Multibank (after a registered trade mark in Portugal).

### 1.2 THIRD GENERATION:

**International Mobile Telecommunications-2000 (IMT-2000)**, is a 3rd Generation, mobile telecommunications standard framed by the International Telecommunication Union. It includes GSM EDGE, CDMA 2000 and UMTS services. It includes wide-area wireless voice telephone, wireless data and video calls. Using 3G a duplexed speech and data services can be provide with higher data rates. Improved spectral efficiency is one of the salient attribute of 3G. 3G technology is a evolutionary standards that are backwards-compatible to pre-existing 2G technology as well as revolutionary standards that can incorporate all-new networks and frequency allocations.

### 1.3 SIM:

A **Subscriber Identity Module (SIM)** popularly known as SIM card securely stores the service-subscriber key (IMEI). It is used to identify a subscriber on a electronic gadget. The SIM card can be easily removed and inserted in the required slot to provide variety of services through IMEI.

Two standard size SIM cards are available in market. One is 85.60 mm × 53.98 mm x 0.76 mm. The next miniature version is 15 mm x 25 mm x 0.76 mm. One of its corners is truncated to prevent wrong insertion.

## II. PROPOSED METHODOLOGY

In our work we have proposed a ATM that can work with our SIM card. In conventional ATM we have slot for inserting our plastic card. In our system a slot for reading the SIM CARD is incorporated. It reads the SIM and links with the bank's server data base which verifies the user identity. Also the camera in the ATM captures the image of the customer which is verified with the information in the data base. If all the details are matched then only the user is allowed to transact money.

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Another special feature include in our system in the Voice Annunciator. In all ATM's the interaction between user and machine is via the key board. In our system once the two level authentication is done the system automatically recognizes the blind person from the data base and triggers the Voice Annunciation system on. It assist the visually impaired person to carry out the transaction with ease.



Fig.1 Existing ATM



Fig.2 3G ATM

## 2.1 BLOCK DESCRIPTION:

The block diagram show a SIM scanning device in which the customer's SIM has to be inserted. It is GSM device which is linked with the server's data base.

The Data Transfer Unit perform the function of comparing the details of the SIM and matches the image of the customer captured by the camera in the ATM with the image in the data base. The Voice Annunciator system automatically announces each operation to be performed which will assist the blind and also normal people in their own language.

If the authentication of the customer fails then alarm is buzzed and message is sent to the owner and also to the nearby police station automatically.

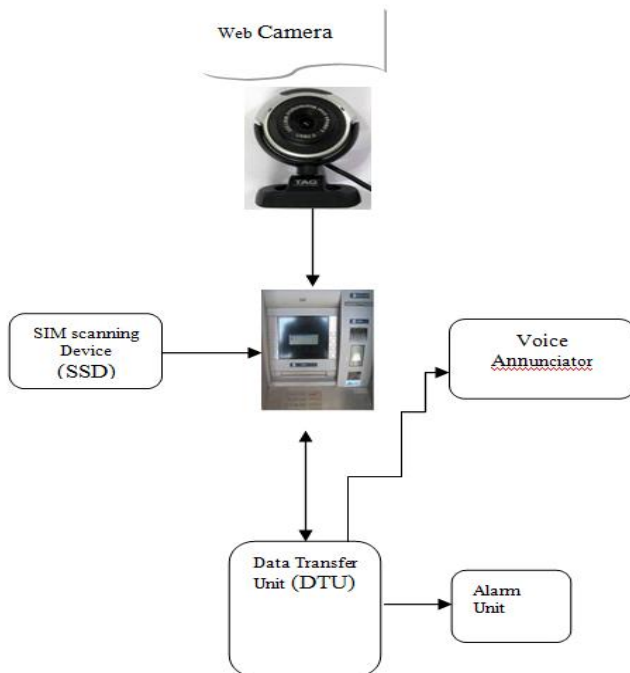


Fig. 3 Block Diagram

## 2.2 SERIAL COMMUNICATIONS:

In Serial Communication information is transmitted one bit at a time. In today's processor data is considered as group of eight bits called byte. The function of serial port is convert

bytes in to streams for transmission and streams in to bytes for reception. Universal Asynchronous Receiver/Transmitter (UART) is the main component of serial port which does the conversions.

The UART sends a **START BIT** which is a positive voltage (0), succeeded by the data and ends with one or two **STOP Bits** which is a negative(1) voltage. This process is repeated for each byte of information to be transmitted.

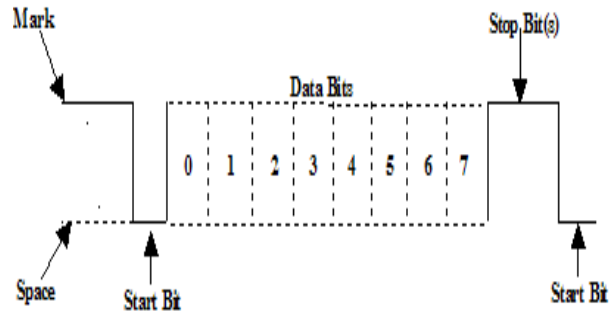


Figure 4 :Byte transmission

## 2.3 FPGA

It is a Programmable Digital Logic Chip that can realize any digital function. It contains a regular structure of logic cells and interconnect, which can be programmed by users. The salient features of FPGA are

- Channel based routing.
- Fast register pipelining.
- Post layout timing.
- Fine grained

The state of FPGA are configuration and user mode. Once the power is switched ON an FPGA will be in configuration mode. Stream of 0's and 1's are downloaded in to the FPGA through the respective pins. Once configuration is complete user-mode is activated and the FPGA can be programmed according to the users program..

## 2.5 GSM MODEM:

It is a wireless modem which requires a wireless network to function. A wireless modem is similar to dial-up modem. A dial-up modem requires a fixed telephone line where as a wireless modem establishes communication through radio waves.

A GSM modem is of two types. First is it can be a external device. Second is it can be a PC Card / PCMCIA Card. First type is connected to a computer through a serial or a USB cable. The second one is designed for use with a laptop computer which should be inserted into one of the PC Card / PCMCIA Card slots of a laptop computer. To operate a GSM modem requires a SIM card.

GSM modems and dial-up modems support a common set of standard AT commands. In addition to that it also support an extended set of AT commands. Using the AT commands, the tasks performed are

- Reading, writing and deleting SMS messages.
- Reading, writing and searching phone book entries.
- Monitoring the signal strength.
- Sending SMS messages.

- Monitoring the charging status and charge level of the battery.

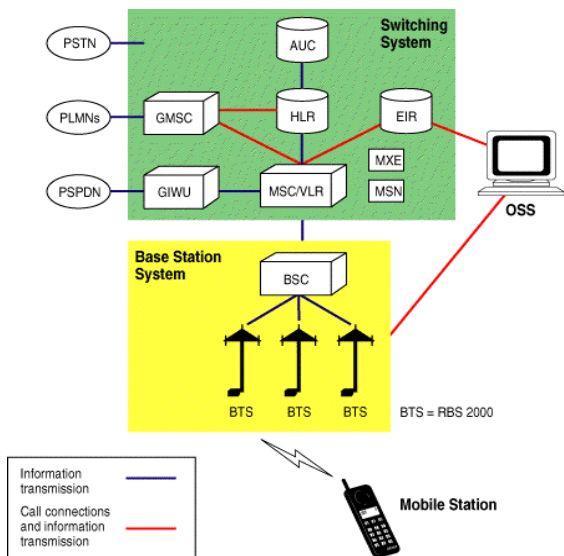


Fig.5 GSM Network Elements

**2.6 VOICE ANNUNCIATOR MODULE:**

The ELK-124 v.2 is the latest available voice module. It has recordable enhanced 8 voice Channels. It is suited for applications such as security, access control warnings, museum narrations, telephone on-hold announcements. All the channels can store up to 1 minute of recorded voice. A built-in microphone and record button makes recording faster and simpler.

**2.6.1 FEATURES:**

- non-volatile memory.
- Continuous playback
- Built-in condenser microphone.
- Adjustable speaker volume
- 24 watt audio amplifier for Speakers..
- PC sound card interface connector.
- Mounted inside plastic enclosure.
- Lifetime Warranty

**2.6.2 SPECIFICATIONS:**

- 11 to 14 Volts DC.
- .2 to 2 Amps
- 122 db. @ 1 meter, 14 vdc sound level
- Ohms speaker loading.
- 6.5" W x 4.375"H x 2"D, size and enclosure is White Plastic.



Fig.6. Programmable Annunciator BT Voice Synthesizer

**III. RESULT:**

From this implementation by SIM card and facial recognition we can construct a advanced intelligent ATM Security which curbs theft and totally stops unauthenticated users.

S.NO	TYPE	LEVEL I VERIFICATION	LEVEL II VERIFICATION
1.	MATCHED ENTRY	25 VERIFIED	24 VERIFIED 1 FAILED
2.	MISMATCHED ENTRY	25 VERIFIED	25 FAILED
3.	INVALID SIMCARD	25 FAILED	NOT ALLOWED

The synthesized system is tested with 25 images of persons and their SIM card. The result was accurate as it undergoes two level authentication. Then 25 sets of random images and different SIM card was tested and all the time authentication failed.

**IV. CONCLUSION:**

Our proposed system is a secured system for ATM with voice annunciator module to aid blind people. In future anti-theft system for automobile users can be provided by embedding out work. It is also possible to stop the theft in our homes by using SIM card and facial recognition to unlock our house doors.

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## AUTHORS PROFILE



**Dr. S. Mahaboob Basha** is currently working as Assistant professor in department of ECE, R.M.K. Engineering College. He has around 20+ years of teaching experience. He received his B.E in ECE from Anjuman Engineering College, Karnataka University, India in 1998 and M.E, Applied Electronics in GCT, Coimbatore in 2003. He has completed Ph.D. in Anna University in the area of VLSI Design in August 2019. His area of interest is in the field of VLSI and Signal processing. He is a life member of the Indian society of technical education. He has published 9 papers in International Journals and 10 papers in Conferences.



**Mr. V. Ramkumar**, is currently working as an Assistant professor in the department of Electronics and Communication Engineering at R.M.K. Engineering College He received his Bachelor degree in Electronics and Communication Engineering and post graduate degree in Communication Systems from Anna University, Chennai. His research interest is in RF and Microwave Engineering and Embedded System. He is a life member of the Indian society of technical education and also member of International Association of Engineers.



**S.P. Vijaya Vardan Reddy**, Assistant professor Department of Electronics and Communication Engineering, R.M.K. Engineering college has 7 years of experience in teaching. He received his Bachelor's degree in ECE from SKR Engineering College in the year 2010 & Master's degree in Communication Systems from Rajalakshmi Engineering College, Chennai in the year 2012. He has presented 4 papers in National Conferences and 6 papers in International conferences & published 2 journals. He is a member in All India Engineers Association and ISTE. His research areas include Networks & Embedded Systems.



**V. Bhuvanewari**, Assistant professor Department of Electronics and Communication Engineering, SRM Institute of Science and Technology has more than 10 years of experience in teaching. She received her Bachelor's degree in ECE from SA Engineering College in the year 2006 & Master's degree in VLSI Design from Dr. MGR University, Chennai in the year 2011. She has presented 10 papers in National Conferences and 3 papers in International conferences & published 4 paper in International journals. She is a member in IET. Her research areas include VLSI and Signal Processing.



**Mr. V. Praveen Kumar**, was received his B.E. degree in Electronics and Instrumentation Engineering from the Anna University, India, in 2010 and He is Currently working as a Senior Engineer at Nagman Instruments and Electronics Pvt Ltd, Tamilnadu, India and his research interest is in Instrumentation sectors and PCB Design.