



**IJIRCCCE**

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

**Volume 10, Issue 5, May 2022**

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

**Impact Factor: 8.165**



9940 572 462



6381 907 438



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# E-Passport Using RFID Tag and Fingerprint Sensor

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**Abstract:** Advancements in technology have created the chance of larger assurance of correct travel document possession, however, some issues relating to security and effectiveness stay unaddressed. Electronic passports have notable a good and quick reading all around the world since the International Civil Aviation Organization the globe have adopted standards whereby passports will store biometric identifiers. The employment of life science for identification has the potential to create lives easier, and therefore the world folks board a safer place. The aim of biometric with RFID Tag suggests that e-passports are to stop the misappropriated entry of a person into a selected country and limit the employment of counterfeit documents by a lot of correct identification of a person. This paper analyses the fingerprint biometric e passport style. These papers concentrate on the privacy and private security of bearers of e-passports, the particular security profit countries obtained by the introduction of e-passports victimization fingerprint recognition systems. The research worker analyzed its main crypto graphical features; the fingerprint life science presently used with e-passports and regarded the encompassing procedures. Research worker centered on vulnerabilities since anyone willing to bypass the system would select a constant approach. On the contrary, only wishing on them could create a risk that didn't exist with previous passports and border controls. The paper conjointly provides a security analysis of the e-passport victimization fingerprint biometric with RFID tags that are supposed to produce improved security in protective biometric info of the e-passport bearer.

## I. Introduction:

Physical passport verification is time consuming and error prone. This project eliminates forgery and time wastage in validating passports. RFID tags and fingerprint scanner stores a unique code with a special encryption that is used to access the user data stored on the database.

### Goal and Objectives

- To analyse and determine the advantages of e-passport.
- To make recommendations on improvement on the current used passport.
- To design and construct an RFID and biometric passport system prototype.

## II. MATHEMATICAL MODEL

### System Description:

- Input: Passenger/User Information-Biometrics,RFID Tag.
- Output: E-Passport with RFID Tag and Biometrics associated with it.
- Classes - User, Admin, Government Hospital, Police, Passport checker, Passport registration Officer.
- Functions:
  - Add details ()-user details, user fingerprint, user RFID
  - Update details ()
  - Registeruser()
  - View user ()
  - Login ()
- Success Conditions: Successful validation of given information and stored information of the user.
- Failure Conditions: Internet failure, Incorrect data about user.

## III. LITERATURE SURVEY

The e-passport possesses two aspects of technology which are RFID and biometrics all incorporated so as to securely identify and verify the bearer possessing that travel document. In this section of chapter one the writer will site,



acknowledge and quote similar works that have been done on the e-passport in brief and also state how this project is going to be different from all these works.

E-passports are already available and in use in several European countries and several researches have been conducted around the world following their deployment in these countries. [5] Kumar et. al discussed the efficient implementation of e-passports scheme using cryptographic security along with multiple biometrics. In this article he states that an e-passport is an identification document which possesses relevant biographic and biometric information of its bearer on paper and also has this information embedded on an RFID chip which is capable of cryptographic function laity. However, this project seeks to eliminate the design of having a passport booklet with an RFID chip embedded on it but instead just make use of an RFID card with all the information stored on that card.

In the e-passport design Kumar also talks of the certification whereby the authentication procedure involves two processes which are Registration and Verification whereby during the former phase the applicant registers their biometric under human supervision and the data is stored on the passport tag. However, the e-passport designed in this project differs in the sense that instead of having the data stored on the tag to be duplicated on the paper passport, the data should be stored in a centralised system database which is only accessible to the authorised personnel at the border controls. Such that the border official will have to physically check what the system is presenting with the physical appearance in-front of them to see if it matches.

In a thesis written by BC Vollmer in 2006 titled Biometrics, RFID technology and the passport he states that the American e-passport will have an RFID chip embedded inside the back cover of the passport booklet and it will store the same information that is printed on the bio-data page of the passport booklet. This project argues that if the passport booklet and the chip are both stored with the same information why then not resort to only one thing the RFID card which will store all the information because RFID cards are easy to replace if lost or stolen and they are portable (easy to move around with or carry with you all the time) than a passport booklet. Take note that the RFID card and the Chip use the same principle of operation and the same technology. No doubt that this RFID card then must incorporate strong security features to guard against skimming and information altering. Vollmer also states that the RFID chip found in the e-passport is a passive, write once, read many version of an RFID chip technology. Whereas this project would like to consider the possibilities of writing on the RFID card several times so as to constantly update the photographs of the passport holders in the system after a certain period of time so as to keep them updated as possible. With the American e-passports chips cannot be altered after production. The writer Vollmer mentions also of the read range of this American e-passport which is about 121.92cm and it is the read range when the passport is opened. Now with the RFID tags it will depend with the type which one is using but the ones suitable for this project are the Low frequency RFID tags which have a lower read range than that of the chip. Since both use the RFID technology the Faraday Cage may be used to shield the RFID cards or the chip from transmitting any further than a few centimetres. An E-Passport holder holds an electronic chip such as RFIDs and fingerprint. The chip holds the similar data that is printed on the passport information page such as the passport holders name and other information. An E-Passport holds a biometric identification. The US needs that the chip should contain a digital photograph of the passport owner. All E-passport issued by Visa Waiver Program countries and the United States have security features to prevent the unlicensed analysis or scanning of data stored on the E-passport chip. This RFID and Biometrics technologies was proposed in paper The study of recent technologies used in E-passport system. Personal credentials and bearer's biometric data is stored on RFID chip which is used in verification process by border security officers. The next generation of e-passports will implement more advanced cryptographic mechanism, collectively known as Extended Access Control, and in particular a protocol referred to as Chop Authentication that protects an e-passport will implement more advanced cryptographic mechanism, collectively known as Ex tended Access Control, and in particular a protocol referred to as Chip Authentication that protects an e-passport against cloning and transferability attacks. The Extended Access Control Suite of Protocols has found minor attention in the literature until now. With these entire facts one can conclude that with the use of an RFID based e-passport it will be very difficult for sophisticated counterfeiters to steal these RFID based e-passports cards and alter the details to match them. It should prove to be impossible.

#### **IV. PROPOSED IDEA**

An E-Passport is an ID document which possesses related biometric information of its bearer. It is embedded in RFID tag which is accomplished of cryptographic functionality. The successful implementation of biometric techniques in documents such as E-Passports aims to the strength of border security by decreasing the possibility of the documents holder.





The e-passport also offers substantial benefits to the rightful holder by providing a more sophisticated means of confirming that the passport belongs to that person and that it is authentic, without privacy. The states are currently issuing e Passports, which corresponds to more than 50 percent of all passports being issued worldwide. This represent a great enhancement in national and international security as it improves integrity of passports by the one printed in the document and to the physical characteristics of the holders; and enables machine-assisted verification of biometric and biographic information to confirm the identity of travellers. Until recently, the travel documents such as a passport where just on paper possessing only the biographic information of the holder. However, there has been a shift in technology such that biometric technologies may now be implemented in travel documents. When implemented in travel documents such as passports these are known as electronic passports (e-passports) aiming at strengthening security and reducing forgery. Secure and trusted travel documents are an essential part of international security, as they allow states and international institutions to identify the movement of undesired or dangerous persons.

The growing use of Radio Frequency Identification (RFID) technology to enhance ubiquitous computing environments has only begun to be realized. [1] This project is demonstrating the implementation of an e-passport using Radio Frequency Identity (RFID) cards to store both the biographic and biometric information of the holder, at the same time exasperating to overcome the limitations that come with RFID such as:

1. RFID is susceptible to easy disruption - This is because RFID systems make use of the electromagnetic spectrum thus they are easy to jam if energy is applied at the right frequency. If this is to happen at the border control checkpoints it can be very disastrous and it will inconvenience the travellers because this will mean longer waits at the checkpoints.
2. RFID reader collision - If this system is to be implemented most probably at the border control checkpoints there will be many readers, then certain techniques must be implemented to overcome this problem. Reader collision takes place when there are two or more signals from different readers that will be overlapping. One of the techniques that may be implemented to overcome this problem is making use of an anti-collision protocol.
3. Tag collision - If this system is implemented this is a more realistic problem as it is due to the presence of many tags in a small area. At the border controls of a truth there is no point where there will only be one tag to be read, but the reader must be able to differentiate signals from different tags if this is achieved then at the same time the chances of having one's RFID card being read without their knowledge is reduced or even eliminated. Also if this is achieved this will mean that tags will only be read when tapped, swiped or scanned.
4. Security problems with RFID - If RFID tags are used with a high gain antenna they may be read at a greater distance leading to privacy problems. However, this may be overcome by using low gain antennas such that the distance between the tag and the reader is kept very small.

The project is interested in finding out if the integration of RFID into pass ports will improve the robustness against identity theft by storing the information of the passport bearer electronically on an RFID card in the project prototype and identifying the e-passport holder. The implementation of the RFID e-passports might eventually replace the conventional paper passport and accelerate clearance through passport controls.

**Fingerprint Identification:** Fingerprint recognition is one of the most popular and successful methods used for person identification, which takes advantage of the fact that the fingerprint has some unique characteristics called minutiae [2]. A fingerprint in its slender sense is a control left by the friction ridges of a personality's finger. In a wider use of the term, fingerprints are the traces of control from the friction ridges of any part of a personality's or different primate hand. A print from the foot may leave control of friction ridges. A friction ridge could be a raised portion of the cuticle on the digits (fingers and toes), the palm or the only of the foot, consisting of one or more connected ridge units of friction ridge skin. These are usually referred to as "epidermal ridges" that are caused by the underlying interface between the dermal papillae of the derma and also the interpapillary (rete) pegs of the stratum. These dermal ridges serve to amplify vibrations triggered, for example, when fingertips brush across Associate in a nursing uneven surface, better transmitting the signals to sensory nerves involved in fine texture perception. These ridges conjointly assist in fascinating rough surfaces, as well as smooth wet surfaces.

## V. CONCLUSION

Thus we have done a survey on E passport using fingerprint. This system will help citizens to have ease of access. The system will be convenient and user friendly.



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INNO  SPACE  
SJIF Scientific Journal Impact Factor

Impact Factor: 8.165

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**CROSS** **ref**

**ISSN** INTERNATIONAL  
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