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SECURITY FOR ATM SYSTEM BY USING FINGERPRINT AND DNA STRUCTURE

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ABSTRACT

In our day to day life we are more careful about the security. As the day passes, we provide the different security technology to different applications. The security is play the important role of our life, by using security we protect our data. We provide the best security to the money or important data. To secure this things the wide range of security flaws have been increased and at the same time security concerns in user identification and authentication has also increased and play an important role in banking sector. This seminar present a high secure system that increases the ATM security. In this technique no need to remember the password and DNA data. In this technique the DNA data will be digitized and convert to barcode by using barcode generator, which is store back to ATM card by collecting the measured DNA data and fingerprint. Barcode technology is one of the most important parts of Automatic Identification and Data Capture (AIDC), we can obtain decoded data through analysis of barcode. This technology can identify the proper user of ATM card by collecting the measured DNA data and fingerprint captured by fingerprint scanner. By using this technology we can reduced many financial loss and illegal attacks. DNA barcoding uses short gene sequences which are well classified portion of the genome. With the advent of high throughput sequencing technology such as Next-Generation Sequencing (NGS) technology the DNA barcoding has become more accurate, fast and reliable in the last decade. In this seminar to summarized the recent advances and developments in the DNA barcoding attempts across animals, plants, bacteria, fungi and viruses. In this seminar also attempted to present the popular tools used in DNA barcoding in a chronological order of their development. DNA barcoding has many applications in various fields like preserving natural resources, protecting endangered species, controlling agriculture pests, identifying disease vectors, monitoring water quality, authentication of natural health products and identification of medicinal plants.

KEYWORDS: ATM, Fingerprint, Authentication, DNA Barcode, DNA Barcode Generator.

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INTRODUCTION

As we know that from the past 3 decades, customers have been mostly using on and trust ATM Machine, called ATM machine to handled their banking needs. Using an ATM machine, customers will access their bank accounts for to create money withdrawals, debit card cash advances, and check their account balances further as purchase post-paid telephone credit and many more. We know most ATMs areconnected to interbank networks, individually to withdraw and deposit cash from Machines not belonging to bank wherever they have their accounts wherever their accountare held. Now a days, ATM fraud has recently creates a lot of problems. Fraud technique like card skimming, shoulders surfing etc has been created recently. So we can use the barcoding technique like as Fingerprint scan to increase the security, but this technique also be hack or crack. So as to extend the amount of security in ATM system, use of fingerprint biometric technique and DNA barcodehelps for easy verification. Biometrics will be outlined as a measurable physiological and behavioural characteristic that may be subsequently compared and captured with another instance at the time of verification. These technologies area unit a secure means of authentication as a result of information of each method are distinctive, not be shared, traced unnoticed [1].

WHAT IS DNA BARCODING?

DNA is known as DNA profiling or identity testing, in genetics science, method of isolating and identifying variable components within the base-pair sequence of DNA (deoxyribonucleic acid). The procedure for conducting a DNA identity test consists a sample of cells, such as skin, hair or blood cells, which contain DNA. The DNA is extracted from the cells and purified [2,3].

DNA bar coding is an exciting new tool for taxonomic research. The DNA barcode is a very short, standardized DNA sequence in a well-known gene. It provides a simplest way to find the species to which a plant, animal or fungus belongs. DNA barcoding uses short DNA sequence instead of whole genome. DNA barcode is short DNA sequence made of four nucleotide bases A (Adenine), T (Thymine), C (Cytosine) and G (Guanine). Each base is represented by a unique color in DNA barcode. DNA Barcoding is generating a worldwide, open access library of reference barcode sequences that allows non-taxonomists to identify specimens. The barcode of an unidentified specimen are often compared with the reference barcodes to find the matching species. Barcoding projects have already generated hundreds of thousands of reference barcodes for tens of thousands of species [1,4,5,6].

The DNA barcode of an unidentified specimen can be perused utilizing standard quality sequencing methods. DNA bar coding incorporates three kinds of methods.[1]

1. Working with life forms: gathering, unmistakable, and defensive voucher examples in secure vaults.
2. Laboratory methods: Sampling and preparing tissue from examples to acquire DNA standardized tag quality successions.
3. Managing information: Sharing the DNA scanner tag succession and information in regards to its voucher example in an open database.

WHY USE DNA BARCODING?

There are two ways customer can perform their banking activities. First one physically interacts with banking staff and second one is Electronic transaction (ATM transaction, online transaction and E-coin).For the first case bank staff manually authenticates a user based on check book, customer signature and photo. In the case of

Electronic transaction bank follows conventional method where authenticate a user based on user id and PIN (personal identification number)[6]. But in this case security is one of the major issues regarding electronic transaction. Inrecent year the rate of cyber-crime increases day by day. The criminal attack not only cyber security and cyber information they also collect personal information and attack on Electronic banking system [4]. Fraud technique like card skimming, shoulders surfing etc. has been ascertained recently. So as to increase the amount of security in ATM system, use of biometric technique and DNA barcode helps for easy verification. Biometrics will be outlined as a measurable physiological and behavioural characteristic that may be subsequently compared and captured with another instance at the time of verification.

LITERATURE SURVEY

In the course of the most recent decade the field of DNA barcoding has developed as an atomic technique for animal types recognizable proof. DNA barcoding depends on a uniform district of the mitochondrial quality being enhanced, sequenced, and investigated by correlation with an open access database. Utilizing sub-atomic scientific categorization to make a natural scanner tag that distinguishes creatures/ creatures is the focal objective of DNA barcoding, and in addition making an institutionalized reference library for the DNA based recognizable proof of target species [7]. There are two focal principals of DNA barcoding: institutionalization of the PCR(polymerase chain response) strategies and conventions, and the capacity to develop the information as the science advances [8]. DNA barcoding can adjust field misidentification, lessens uncertainty of species recognizable proof, makes species distinguishing proof more correct, democratizes access by making open access databases, and extends specialized aptitude of taxonomists [11]. DNA based ID frameworks utilize institutionalized sub-atomic science systems (DNA extraction, PCR, and DNA sequencing) that can expand the speed of the recognizable proof of an obscure life form/creature [10]. The motivation behind this course is to give a general foundation on DNA barcoding, and outline the strategies that are utilized by the Reclamation Detection Laboratory for Exotic Species (RDLES). The Canadian Center for DNA Barcoding (CCDB) is a pioneer in DNA barcoding, with distributed conventions on an extensive variety of living beings/creatures. CCDB has created conventions for PCR preliminaries, ace blends, and PCR projects to open up DNA, which are distributed on the web and are straight forward to perform (CCDB site).

HISTORY

- This method is developed in 1984 by British biogist Alec Jeffreys, he saw that specific successions of very factor DNA (known as minisatellites), which may not add to the elements of qualities, are rehashed inside genes[9].
- Jeffreys recognized that every individual encompasses a distinct pattern of minisatellites (the only excepted as identical twins and clones).
- The story starts with two workshops at Cold Spring Harbor Laboratoryin 2003 to discuss the value of DNA barcoding and the feasibility of an organized effort. By many accounts the first of those workshops was not a pleasant meeting.
- They were to say the least - skeptical could reliably serve as ID tool. This initial resistance did not vanish into thin air. “Biological identifications through DNA barcodes”, currently considered a keystone publication and cited more than 2500 times over the last ten years, was initially rejected.
- 2004 was also the year that saw the birth of an unrivaled online resource, both database and workbench at the same time. Today the Barcode of Life Datasystems (BOLD) is the

leading support system for the generation and application of DNA barcode data.

- It is home to in excess of 2.7 million standardized identification groupings speaking to around 370,000 species. This is to a great extent the aftereffect of a natural development of national and local systems.
- The thought of utilizing a short quality arrangement to recognize species and distinguish examples quickly caught the creative energy of numerous researchers, DNA barcoding was formed through the logical debate and developed into an all-inclusive acknowledged innovation with various potential.
- Only one year after the Banbury gatherings, the Consortium for the Barcode of Life (CBOL) was set up at the Smithsonian Institution. CBOL's primary objective was to create DNA barcoding as a worldwide standard for animal categories recognizable proof.
- Consequently, CBOL composed the First International Barcode of Life Conference at the Natural History Museum in London in February 2005 and encouraged the advancement of global traditions, for example, the standard loci for major scientific categorizations.The launch of the International Barcode of Life (IBOL) project in 2010 greatly increased the speed of barcode data generation.
- In October 2013, 8 years after the first conference in London, the community met again for the Fifth International Conference in Kunming, China.

SYSTEM ARCHITECTURE

As there are problems in identifying the fingerprints of users in accessing ATM System, a new method is proposed in which normal fingerprint scanner add-ons to DNA barcode generator.At very first the users have to give his or her fingerprint impressions generated by fingerprint scanner and DNA samples while opening the account in the bank. Sampling and processing has been done on DNA samples and finally they are converted to barcode by using DNA barcode generator. The obtained barcode is attached on the back of individuals ATM card. While processing with the ATM, the fingerprint scanner has to be attached with the ATM terminal. When the user inserts his or her ATM card, and then places their finger on fingerprint scanner which captures the impression of fingerprint. The DNA barcode which is present on the back of ATM is scanned. The impression of finger and DNA barcode are taken as input and some of the features are extracted and stored as template. This template verifies with the stored database at bank.

Figure 1.ATM acceess using DNA Barcode

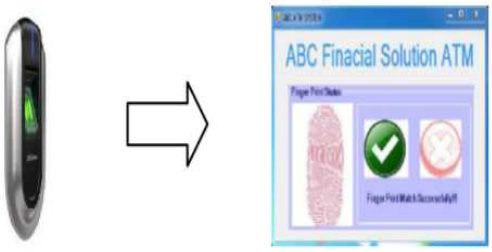

Figure 2.Authentication using Fingerprint

If DNA and fingerprint match occurs, the user has given access rights to perform transactions. If match does not occur, the user has no access rights to perform transactions. The transaction has beendenied.

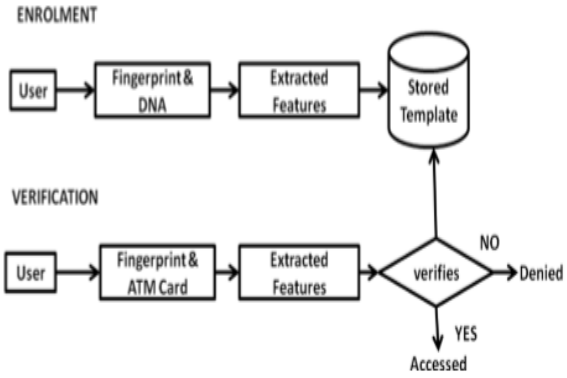

Figure 3.Flowchart For Opening Account And Accessing Account

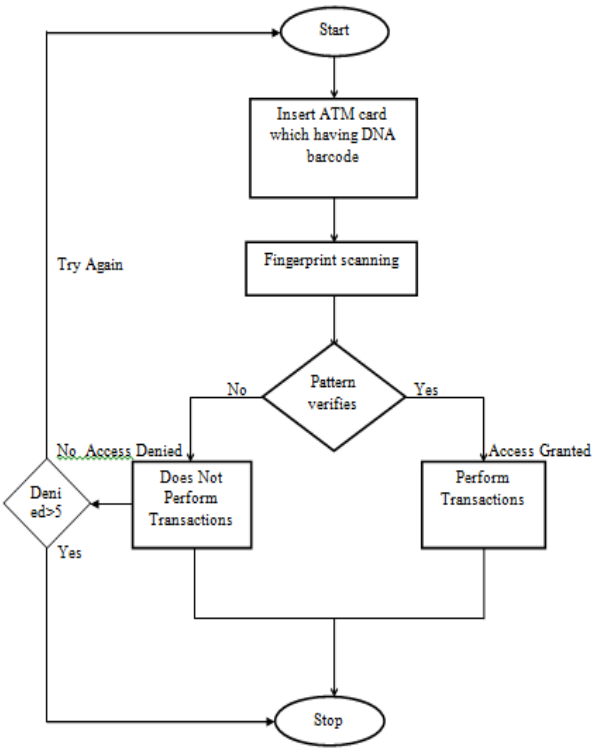

Figure 4.Flowchart of DNA barcode ATM system

WORK FLOW

- DNA barcoding has three main steps: DNA extraction, PCR amplification, and DNA sequencing and analysis (Figure 5).
- DNA isolation is a key step because, without high quality DNA, the PCR amplification will not be optimal. The PCR amplification has to work so that there is DNA for sequencing. And finally, the sequencing analysis has to be successful for there to be an identification of the organism.
- Ensuring that these three steps are optimal is important for successful DNA barcoding. It is important to note that modifications to the DNA extraction process can sometimes be necessary.
- In a push to streamline DNA barcoding at RDLES, a barcoding standard working method (SOP) was made [12].
- RDLES utilizes the Qiagen DNA extraction strategy to remove DNA for barcoding, this technique is likewise utilized by the FDA for the examination of fish tests [13]. This strategy requires around 10 mg of test tissue.
- Following the PCR intensification, the PCR item is examined on an agarose gel to affirm that enhancement has occurred[14].
- If there is a band, the PCR item can be sent for DNA sequencing. On the off chance that there is no intensification, it will be important to investigate the tissue. This may require rehashing the DNA extraction, experimenting with an alternate preliminary match.
- Once a PCR item has been gotten it is sent to a sequencing organization to decide the character of the creature. The sequencing organization gives a ~700 base match DNA succession that without bioinformatics has no importance.
- There are two projects that can be utilized to dissect the DNA arrangement: Barcode of Life Data Systems (BOLD) and National Center for Biotechnology Information (NCBI) Basic Local Alignment Search Tool (BLAST). Each program has positive and negative qualities.
- DNA BOLD is a free program that thinks about the DNA grouping to tests that have been distinguished by a taxonomist and incorporate extra information about the example. This site is a center point for DNA barcoding data and examination.
- NCBI BLAST is additionally a free program accessible on-line, were scientists can submit non-vouchered DNA groupings to the database. This program will contrast the DNA succession with both vouchered and non-vouchered tests.
- Both of these projects utilize arrangement projects to decide the character of the obscure succession. It is useful to utilize both autonomous databases to recognize the creature since it can expand the sureness of the ID.
- It is conceivable that the two projects won't concur on the distinguishing proof it and not all creatures are in both the databases[15].

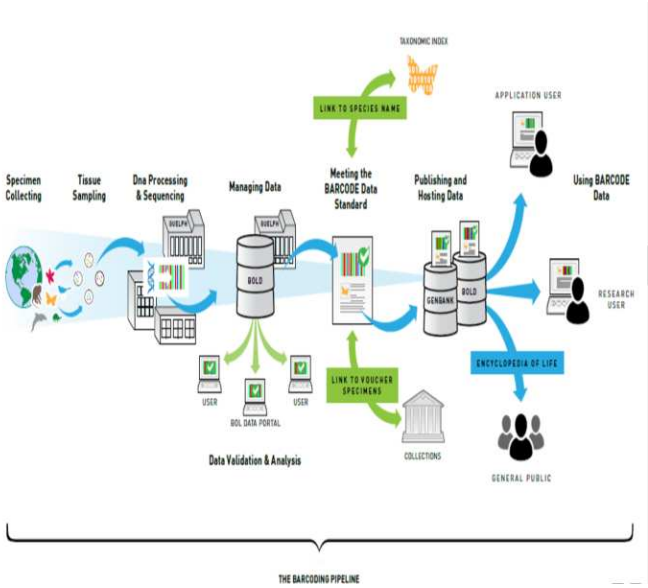

Figure 5.DNA Barcoding Work Flow

Table 1.Diffrent Methods of DNA Barcoding, Tools and Their Web Addresses

Tools	Launch Year	Method	Available at
Taxl	2005	Distance Based	axel.meyer@unikonstanz.de
4 SALE	2006	RNA Alignment and Editing	http://4sale.bioapps.biozentrum.uniwuerzburg.de
CAOS	2008	Character Based	http://sarkarlab.mbl.edu/CAOS
Bio Barcode	2009	Sequence Based	http://www.asianbarcode.org
B	2010	Sequence Quality and Contig Overlap	http://www.nybg.org/files/scientists/dlittle/B.html
BRONX	2011	Sequence Identification Based	http://www.nybg.org/files/scientists/dlittle/BRONX.html
Spider	2012	Analysis of Species Identity and Evolution	http://spider.r-forge.r-project.org/SpiderWebSite/spider.html
LV Barcoding	2013	Locality Sensitive Hashing Based	http://msl.sls.cuhk.edu.hk/vipbarcoding
Excali BAR	2014	Intra and Inter Distance	http://datadryad.com/resource/dryad.r4
Q-Bank	2015	Detect Reference Database	http://www.q-bank.eu

ADVANTAGES

1. The combination of finger print and DNA data gives more accurate and precise results than existing methods as ATM access with fingerprint and other methods.
2. It is used for fast and accurate authentication.
3. It is used as evidence in many applications in computer forensics.
4. It cannot be copied or forged.
5. DNA evidence is key to find the suspects of various types of crime.
6. This method can be used in performing E-transactions and identification of users in many applications.

APPLICATIONS

CONTROLLING AGRICULTURAL PEST

DNA barcoding can help in distinguishing vermin in any phase of life making less demanding to control those sparing ranchers from cost of billion dollars from pest damage.

IDENTIFYING DISEASE VECTORS

DNA barcoding allows non ecologists to identify the vector species that can make genuine irresistible infections creatures and people, to comprehend these sicknesses and cure them. A worldwide mosquito barcoding activity in building a reference standardized tag library that can assist general wellbeing authorities with controlling these maladies causing vector species all the more successfully and with less utilization of bug sprays.

SUSTAINING NATURAL RESOURCES

Using DNA barcoding, common asset chiefs can screen illicit exchange of items made of characteristic assets like hardwood trees. Fishbol is reference standardized identification library for hardwood trees to enhance administration and protection of characteristic assets.

PROTECTING ENDANGERED SPECIES

Primate Population is diminished in Africa by 90% as a result of hedge meat chasing. DNA barcoding can be utilized by law authorization to bramble meat in neighborhood markets which is gotten from shrub meat.

MONITORING WATER QUALITY

Drinking water is a procedure asset for living being. By considering living being living in lakes, waterways and streams, their wellbeing can be estimated or decided. DNA barcoding is utilized to make a library of these animal varieties that can be hard to distinguish. DNA barcoding can be utilized by ecological organizations to move forward assurance of value and to make better arrangements which can guarantee safe supply of drinking water.

ROUTINE AUTHENTICATION OF NATURAL HEALTH PRODUCTS

Validness of characteristic wellbeing items is a critical lawful, monetary, wellbeing and preservation issue. Normal wellbeing items are frequently considered as protected as a result of their common source

1. Identifying of plant leaves regardless of whether blooms or natural product are not accessible
2. Identification of medicinal plants

FUTURE SCOPE

In this seminar, to focused mainly on the basic applications of DNA barcodes to increase understanding of community ecological processes and networks. The most significant advance in DNA barcoding in the near future will be the application of new technologies for generating and analyzing DNA barcode sequences. Several studies and reviews have addressed the NGS. NGS will enable the capture of all representative sequences present in a complex mixture of species and then the mapping of those sequences to a reference DNA barcode database.

This application of DNA barcoding to identify component species of an environmental mixture is called ‘DNA Metabarcoding’. Over past 10 years, DNA barcoding has become an invaluable addition to suite of tools to better understand nature and the environment. As the DNA barcode library expands across the tree of life and habitats new and more expansive applications will be explored and developed. This time only at the beginning of applying DNA barcodes to the fields of species discovery, ecology, evolution and the conservation of biodiversity.

CONCLUSION

The development in the electronic exchange has brought about more noteworthy interest for exact and quick client distinguishing proof and confirmation. Biometrics alludes to the programmed acknowledgment of a man in light of physiological and behavioral qualities. The primary purpose behind acquainting DNA barcoding framework is with increment general security. It offers more prominent security and accommodation than customary strategies. DNA barcoding is a framework for quick and precise species distinguishing proof which will make biological framework more open. The proof from various examinations to a great extent affirms the possibility of such a framework. Regardless of a few downsides of utilizing DNA barcoding, the detailed achievement of utilizing the barcoding district in recognizing species from a scope of taxa and to uncover mysterious species is amazing. The blend of DNA standardized identification and unique finger impression biometric validation strategy is exceptionally powerful in ensuring data and it can be an asset in a vast territory of uses. Security issues identified with past strategies can be understood utilizing this method.

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