

# Android based Access Control Systems using Sensory-Data

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## ABSTRACT

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Access card verification is basic and fundamental for some, advanced access control frameworks, which have been broadly sent in different governments, business and private situations. In any case, because of the static distinguishing proof data trade among the entrance cards and access control customers, it is trying to battle against access control framework ruptures because of reasons, for example, misfortune, stolen or unapproved duplications of the entrance cards. Albeit progressed biometric validation strategies, for example, unique mark and iris distinguishing proof can additionally recognize the client who is asking for approval, they cause high framework expenses and access benefits can't be exchanged among confided in clients. In this work, we present a dynamic verification with tactile data for the entrance control frameworks. By consolidating tangible data got from installed sensors on the entrance cards just as the first encoded ID data, we can successfully handle the issues, for example, get to card misfortune, stolen and duplication. Our answer is in reverse perfect with existing access control frameworks and essentially builds the key spaces for validation. We hypothetically show the potential key space increments with tangible data of various sensors and observationally exhibit basic pivots can expand key space by more than 1, 000, 000 times with a verification exactness of 90%. We performed broad reproductions under different condition settings and executed our plan on WISP to tentatively confirm the framework execution.

Keywords - Access card authentication, biometric validation, hypothetically and misfortune

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## I. INTRODUCTION

The primary class depends on mechanical coordinating, for example, keys and mix locks. People are confirmed in these entrance control frameworks if and just if the cutting edge of the key matches the keyway of the lock or the right numerical grouping for blend lock has been dialed. Because of the physical limitations of mechanical coordinating frameworks, they are deficient to meet the requesting prerequisites of access control validation for basic foundations. Then again, it is likewise difficult to much of the time change the inside structure of such coordinating instruments for security improvement. The other class of validation for access control frameworks is electronic confirmation including scanner tag, attractive stripe, biometrics and so on. Contrasted and mechanical coordinating validations, the electronic verifications, for example, RFID-based savvy card offer significantly more accommodation and adaptability for the two directors and clients of access control frameworks. Nonetheless, regardless it experiences comparable issue of key misfortune since verification is just founded on the encoded distinguishing proof information on the card. Any individual who conveys the card will be conceded the entrance and the security of the framework still can be endangered. So as to additionally improve the security of access control frameworks, different biometric verification

instruments have been acquainted with distinguish the approved work force. In spite of the fact that these biometric confirmation techniques, for example, unique mark, iris and voice acknowledgments can give individual distinguishing proof, they have high framework cost and access benefits can't be exchanged among confided in clients. In this work, we go for conquering any hindrance between inadequacy of existing electronic validation arrangements and the expanding request of high security ensure for access control frameworks. We plan a novel electronic closeness confirmation structure that improves the security dimension of existing RFID-based access control frameworks with in reverse similarity. In particular, we include dynamic information into the customary verification data by utilizing sensors, for example, accelerometer, spinner and so on. In synopsis, over the past meeting paper, our commitments in this work are as per the following:

We structure and actualize a dynamic verification structure with tangible data for the entrance control systems. We show the proposed system with two Digital Object contextual analyses and hypothetically demonstrate and that our dynamic confirmation altogether builds the key space for vicinity validation frameworks with the joining of minimal effort sensors. We have completely actualized and constructed a running model of the proposed dynamic validation structure on the Intel Wireless Identification and

Sensing Platform (WISP). In light of the running model, we have broadly assessed our structure regarding framework precision and ease of use in reality settings. Dynamic information into the conventional validation data by utilizing sensors, for example, accelerometer, whirligig and so forth. This confirmation structure is versatile to the difference in encryption multifaceted nature of the entrance control frameworks and could be embraced with minor adjustment of existing foundation. Dynamic validation fundamentally expands the key space for closeness verification frameworks with the joining of minimal effort sensors. We have completely actualized and fabricated a running model of the proposed dynamic validation structure. The Intel Wireless Identification and Sensing Platform (WISP). In light of the running model, we have broadly assessed our plan regarding framework precision and ease of use in reality settings. The distinguishing proof data on access cards ordinarily are static. The expansion of dynamic tactile information from locally available sensors. Fundamentally increment the security key space  $P$  and thus the dimension of security for existing electronic verification frameworks. A wide assortment of sensors including accelerometer, whirligig and so forth. Can be utilized in our framework.

## II. PROBLEM STATEMENT

Access card validation is basic and fundamental for some, cutting edge get to control frameworks, which have been broadly sent in different governments, business and private situations. Albeit progressed biometric confirmation techniques, for example, unique mark and iris distinguishing proof can additionally recognize the client who is asking for approval, they acquire high framework expenses and access benefits can't be exchanged among confided in clients.

## III. RELATED WORKS

A Capacitive Touch Interface for Passive RFID Tags, [2009]. A tale technique for joining a capacitive touch interface into existing uninvolved RFID label designs without extra parts or changes to the assembling procedure. Our methodology utilizes the label's receiving wire as a double capacity component in which the reception apparatus at the same time goes about as both a low recurrence capacitive bordering electric field sensor and furthermore as a RF radio wire. To show the achievability of our methodology, we have prototyped a detached UHF tag with capacitive detecting ability incorporated into the receiving wire port utilizing the WISP tag. At last, we depict how this innovation can be utilized for contact interfaces just as different applications with the expansion of a LED for client criticism. Usage of a living situation enlarged with RFID to upgrade the personal satisfaction and freedom of older residents. Members wear little versatile RFID per user wristbands that report connection with labelled articles. Exercises can be deduced from this information and answered to parental figures. The most straightforward technique depends on estimating the rate at which the detecting capacitor

charges and releases when distinctive materials are set inside its electric fields. Present an investigation of capacitive sensors produced using conductive ink imprinted on paper, for use in intelligent shows and print media. Appropriate to RFID radio wire development which ordinarily utilizes conductive ink imprinted on a plastic substrate. The recurrence detachment of the RFID correspondence and detecting signals takes into account seclusion from one another, the occasion of the client contacting the tag has an impact on the radio wire's resounding recurrence.

A Context-Aware Approach to Defend Against Unauthorized Reading and Relay Attacks in RFID Systems, [2011]. RFID frameworks are winding up progressively universal in both open and private spaces. In any case, because of the natural shortcomings of basic remote radio interchanges, RFID frameworks are tormented with a wide assortment of security and protection dangers. A substantial number of these dangers emerge because of the label's wanton reaction to any per user demands. This renders touchy label data effectively subject to unapproved perusing. Indiscriminate label reaction additionally impels diverse types of transfer assaults whereby a malignant intriguing pair, handing-off messages between a tag and a per user, can effectively imitate the tag without really having it. Because of the expanding universality of RFID gadgets, there is a squeezing requirement for the improvement of security natives and conventions to crush unapproved perusing and transfer assaults. Be that as it may, as of now conveyed or proposed arrangements frequently neglect to fulfill the limitations and prerequisites of the hidden RFID applications as far as (at least one of) productivity, security, and usability. Renders delicate label data effectively subject to unapproved perusing. Data (may essentially be a plain identifier) gathered from a RFID tag can be utilized to follow the proprietor of the tag, or be used to clone the tag with the goal that an enemy can mimic the tag's owner. Promiscuous reaction likewise actuates diverse kinds of transfer assaults. One class of these assaults is alluded to as "apparition and-leech". The bloodsucker would then be able to hand-off the got data to a relating genuine per user and the other way around in the other direction. A pernicious per user utilizing which the proprietor plans to make an exchange. In this assault, the noxious per user, serving the job of a phantom and conspiring with the bloodsucker, can trick the proprietor of the card into affirming an exchange which she didn't expect to make. Unauthorized perusing could be tended to by methods for specific opening of labels, i.e., labels are made to react specifically, as opposed to wantonly. Equipment based particular opening.

Shake Well Before Use: Authentication Based on Accelerometer Data, [2007]. Cell phones without UIs, for example, Bluetooth headsets, regularly need to convey safely over remote systems. Dynamic assaults must be forestalled by validating remote correspondence, which is tricky when gadgets don't have any a Prior data about one

another. We present another technique for gadget-to-gadget confirmation by shaking gadgets together. This paper portrays two conventions for joining cryptographic verification systems with known strategies for accelerometer information examination with the impact of creating validated, mystery keys. The conventions contrast in their plan, one being progressively preservationist from a security perspective, while alternate permits increasingly unique co-operations. Three analyses are utilized to upgrade and approve our proposed verification technique. The consequent matching can be mysterious or "vaporous" for example in view of data just shared over the out-of-band-channel instead of real gadget identities. Using implanted accelerometers, gadgets can perceive connection of their development and use development designs for validation. From a client point of view, together shaking is a basic procedure for partner devices. On secure gadget blending proposed direct electrical contact while different proposals to execute an out-of-band channel incorporate a "physical interlock" and the "Amicability" convention, ultrasound, visual markers and cameras, sound messages, the GSM short message administration (SMS), key examination, remove jumping and honesty codes, or manual input. Castelluccia and Mutaf introduced a convention for matching CPU-compelled remote gadgets under the presumption of mysterious communication channels.

Universally Composable RFID Identification and Authentication Protocol, [2009]. The quantity of RFID applications develops and RFID labels start to enter numerous parts of regular daily existence, worries about their security and protection turn out to be extraordinarily intensified. In the meantime, the intensely confined and cost-touchy nature of RFID labels precludes straightforward re-utilization of existing conventional security/protection arrangements and requires another age of incredibly lightweight distinguishing proof and confirmation protocols. This paper depicts an all-around composable security system tuned particularly for RFID applications. By making RFID-explicit setup, correspondence, and simultaneousness suppositions, we land at a model that ensures solid security, protection and accessibility properties, while allowing the structure of useful RFID conventions. The system bolsters measured sending, which is most fitting for omnipresent applications. As an instantiation of the proposed system, this paper portrays a lot of straightforward, productive, secure and unknown (untraceable) RFID recognizable proof and confirmation conventions. These conventions include negligible communication between a tag and a per user and spot just a little computational burden on the tag. They additionally force minimal computational weight toward the back server. We demonstrate that our conventions are provably secure inside the proposed all-around composable structure. Standardized identifications don't require viewable pathway arrangement with per users for legitimate checking, and their littler structure factor possesses less physical space on the bundling of products. All RFID labels are asset poor (e.g., international ID borne

labels are relied upon to offer open key natives), most retail-style labels, as a result of their colossal scale, should be as modest as conceivable which results in extreme asset constraints. It is anything but difficult to see that the initial three things straightforwardly impact tag cost. In truth, having multiple rounds in per user label communication suggests that the label must keep impermanent state while the convention executes.

Gesture Recognition with a 3-D Accelerometer, [2009]. Signal based collaboration, as a characteristic route for human-PC connection, has a wide scope of utilizations in pervasive processing condition. This paper displays an increasing speed based signal acknowledgment approach, called FDSVM (Frame-based Descriptor and multi-class SVM), which needs just amazement arable 3-dimensional accelerometer. With FDSVM, right off the bat, the increasing speed information of a motion is gathered and spoken to by an edge based descriptor, to remove the discriminative data. At that point a SVM-based multi-class motion classifier is worked for acknowledgment in the nonlinear motion highlight space. Broad trial results on an informational index with 3360 motion tests of 12 signals over weeks exhibit that the proposed FDSVM approach altogether beats other four techniques: DTW, Naïve Bays, C4.5 and HMM. In the client subordinate case, FDSVM accomplishes the acknowledgment rate of 99.38% for the 4 heading signals and 95.21% for all the 12 motions. In the client free case, it gets the acknowledgment rate of 98.93% for 4 signals and 89.29% for 12 gestures. Contrasted with other accelerometer-based signal acknowledgment approaches detailed in writing FDSVM gives the best outcomes for both client ward and client free cases. The execution of such vision-put together methodologies depends unequivocally with respect to the lighting condition and camera confronting edges, which significantly confines its applications in the shrewd environments. TUB-Sensor Glove can gather hand introduction and speeding up, and finger joint angles. Bayesian Networks utilizing nearby maxima and minima as highlights to recognize most of the chose signals and further receives parallel class SVM to separate the disarray motion pair. One of the answers for this issue is to lessen the client endeavours in preparing by adding counterfeit commotion to the first motion information to expand the preparation data. The client autonomous motion acknowledgment is more troublesome than the client subordinate one since there is substantially more variety for every equivalent motion.

An Accelerometer-Based Gesture Recognition Algorithm and its Application for 3D Interaction, [2010]. The VR (augmented reality) framework has the broad application in areas as CAD, E-learning, sports recreation, computerized stimulation. There are cases of VR framework, for example, VNM (Virtual Network Marathon) and VBL (Virtual Biological Laboratory) created by State Key Lab. of CAD&CG in Zhejiang University, Virtual Bicycle Training System structured by Sport System Simulation Lab of CISS. The

fundamental assignment of VR framework including two angles: first, sort out and deal with the virtual scene adequately, and render or depict the virtual items as plainly as could reasonably be expected; also, total the communication errand between the client and the virtual articles precisely. Advantage from the quick advancement of 3D sensible designs in late decades, the present VR frameworks can render expansive scale virtual scene effectively, and give the clients solid inundation. Another essential errand of VR framework is 3D association in virtual condition. D. Bowman et al. characterized "3D communication" as: "Human- PC cooperation in which the client's undertakings are performed specifically in a 3D spatial setting." Different with conventional WIMP style association in 2D program, executed the accelerometer-based signal acknowledgment calculation and used the ease Wiki controller as a collaboration gadget in their examinations. Cases of VR framework, for example, VNM [1] (Virtual Network Marathon) and VBL (Virtual Biological Laboratory) created by State Key Lab. Arrange and deal with the virtual scene successfully, and render or portray the virtual items as unmistakably as could reasonably be expected; besides, total the cooperation errand between the client and the virtual articles accurately. VR frameworks can render substantial scale virtual scene effectively, and give the clients solid submersion. Another essential assignment of VR framework is 3D communication in virtual condition. As a novel cooperation technique, motion acknowledgment has been investigated by numerous analysts. Hofmann, F. et al. Presented the speed profile based strategies which use HMM to perceive human signals? Portillo-Rodriguez. Developed a framework named Smart Design Studio. In view of those past works, Thomas Schooner.

Two-stage Recognition of Raw Acceleration Signals for 3-D Gesture-Understanding Cell Phones, [2006]. The job of phones has advanced from minor voice specialized gadgets to our day by day life associates, they have utilized greater usefulness like cameras, MP3, and web perusing. Despite the fact that the advancement empowers clients to appreciate different capacities whenever, it causes the use issue of controlling numerous capacities with little screen and keypads. In this way, instinctive and intriguing cooperation techniques are basic in cell phones. Nowadays, another sort of association innovation that comprehends clients' development has risen because of the fast advancement of sensor innovation. An accelerometer estimates the measure of increasing speed of a gadget in movement. Investigation of increasing speed signals empowers three sorts of motion association techniques: tilt location, shake discovery and motion acknowledgment. We proposed a remote controller model, Magic Wand, for controlling TVs by motions noticeable all around with accelerometers and gyrotors. The 3-D directions are evaluated by utilizing inertial route hypothesis and afterward arranged. Mantyjarvi et al. likewise distributed a motion intelligent remote controller for controlling DVD players with an accelerometer for perceiving eight

gestures. Analysis of increasing speed signals empowers three sorts of motion connection strategies: tilt discovery, shake identification and motion recognition. The tilt location calculation deciphers the stance of a gadget. At the point

when a client holds it in a static stance, its tilt edge is determined by estimating the proportion of gravity parts in tri-hub. It is utilized for moving cursors in a menu tree or virtual objects. It is utilized for checking the quantity of strolling ventures in Fujitsu's mobile phone F672i and Partech's PH-S6500. Likewise, shaking designs are utilized for distinguishing clients and gadgets. Past motion acknowledgment calculations are not of business quality since acknowledgment approach after direction estimation requires spinners which are not as yet fitted well to PDAs as far as size and cost.

#### IV. SYSTEM ARCHITECTURE

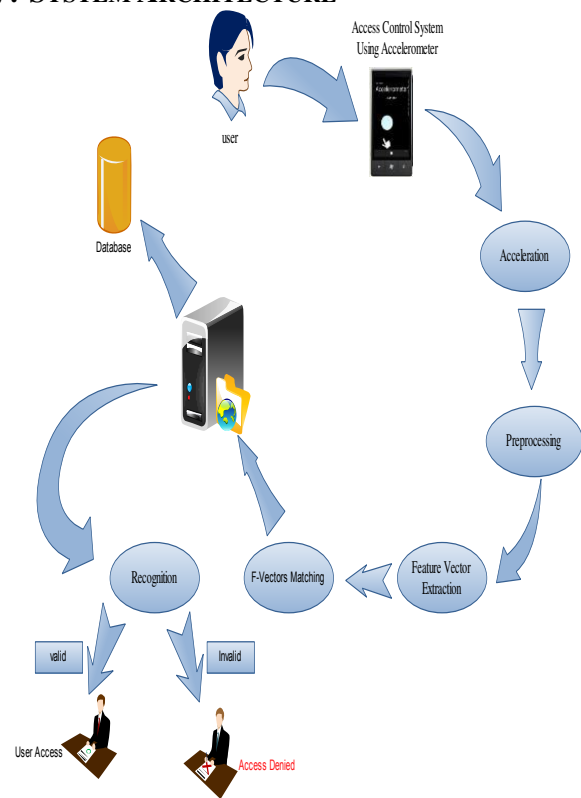


Fig.1 System Architecture Design

The proposed model of this project is as shown in the figure 1 which consists of three main phases as follows,

- Enrollment Phase
- Rotation Recognition
  - Data Pre-Processing
  - Feature Vector Extraction
  - F-Vectors Matching
- Server Verification
- Accessing Service

##### 4.1 Enrollment Phase

The point of this stage is to enable a client and a server to arrange a mutual mystery to verify succeeding logins

for this client. The client starts utilizing Accelerometer sensor for the Access Control Systems.

#### 4.2 Rotation Recognition

Dynamic validation with tactile data structure. In this segment, we further expand on the nifty gritty sensor revolution acknowledgment calculations. By looking at the example information of accelerometer. We find that yield of the accelerometer displays an increasingly perplexing conduct. This is on the grounds that gyration measures the precise speed and will in general create a motivation amid one single fundamental turn, which could be treated as a unique instance of the yield of the accelerometer. Along these lines in this segment, we utilize the tactile information of accelerometer to outline the entire pivot acknowledgment calculations and talk about how to manage the tangible information of whirligig. One complete unique validation process comprises of a grouping of essential revolutions. So as to precisely recognize every individual essential turn from crude accelerometer information, we perform following three tasks in the system server.

#### 4.3 Data Pre-Processing

The initial step of turn acknowledgment is information pre-preparing. The primary objectives are to separate and channel every individual fundamental pivot from a progression of crude accelerometer information. So as to isolate the individual essential turns, we first need to distinguish the respite between two back to back pivots. Amid such stops, the three-hub readings of an accelerometer would remain generally steady and unaltered for a brief timeframe. So as to precisely perceive such stops and separate distinctive fundamental pivots, we receive a sliding window approach. In this methodology, the accelerometer readings in the first two seconds are cushioned into the sliding window. All information in the sliding window are then fitted by a first-degree polynomial capacity. In the event that the coefficient of first-degree polynomial is not exactly a limit (1 in our execution), we consider the accelerometer stay stationary inside the time period of this window. Pursued by this delay recognition in the present window, the window would slide for a stage of  $t_s$  seconds, with  $t_s$  term of new information added as far as possible of the sliding window while the principal  $t_s$  length of tactile information are disposed of. Exactly, we set  $t_w = 1s$  and  $t_s = 0.3s$  in our framework usage. Along these lines, we have accomplished exact division of essential pivots in one complete verification. To imagine above information pre-preparing step, one validation with 4 essential turns that performed gradually on our model usage. The shaded locales speak to sliding windows at three stops. The increasing speeds on three tomahawks of the accelerometer are fairly steady amid stops between various fundamental rotations. After distinguishing delays between essential turns, we at that point utilize least square estimation to fit the crude readings for every individual essential revolution from the accelerometer.

#### 4.4 Feature Vector Extraction

In the wake of isolating essential turns for one single confirmation, we coordinate them with standard element vectors. As highlight based arrangement of time arrangement information has a straightforward model and lower calculation, we pick this technique for pivot acknowledgments. To start with, highlight vectors (F-vectors) for every individual essential revolution are removed dependent on their fitting capacities made in the past segment. In particular, we extricate the begin and end tangible information, the maximal and insignificant sensor readings and the relating time of these occasions inside one essential revolution for a three-pivot accelerometer. An adequately extensive component vector for use in the confirmation convention. In our methodology, the element vector will be utilized to verify a key or to specifically produce a key, and in this manner it should be of high entropy from an assailant's perspective, for example include a lot of vulnerability. We contend that shaking is a suitable development for making entropy: it makes fluctuating sensor readings, since it is one of the human development designs that incorporate the most noteworthy recurrence parts. Slower developments will instinctively not produce as much entropy.

#### 4.5 F-vector Matching

Subsequent to extricating highlight vectors, we at that point attempt to coordinate the removed element vector with standard element vectors in the database to perceive a particular essential revolution. Standard element vectors with given  $n$  could be numerically determined and consequently created since the speeding up segments on three tomahawks speak to a trigonometric association with increasing speed of gravity. Accepting the pivot for instance, after the accelerometer clockwise turns  $\pi$  degrees, the increasing speed parts  $A_x$  and  $A_y$  amid such revolution can be determined as  $A_x = G \cos \theta$  and  $A_y = G \sin \theta$  ( $\theta \in [\alpha, \alpha + \pi]$ ). Along these lines, it is simple for clients to reset their keys with no adjustment on access cards. So as to coordinate extricated F-vectors of an essential turn to standard ones in database, we utilize Euclidean separation to gauge the closeness of these two vectors.

#### 4.6 Server Verification

Server can check the credibility of the enlistment subtleties and afterward acquire with the key. Server likewise looks at the wellspring of got key. At that point server confirms both secret key, the secret word coordinate or not.

#### 4.7 Accessing services

Client enter the program and Register to server then server through mail on secret key then client get the mail and send to server. At that point server confirm both secret key, if right the secret phrase open the view all detail, else if not coordinate that secret key methods you won't permit the site inside.

## V. CONCLUSION

In this paper, we propose a dynamic validation with tactile data for the entrance control frameworks. Not quite the same as existing plans of validation in access control frameworks, which mostly dependent on static data on cards, our dynamic confirmation strategy consolidate tangible data from locally available sensors and regular static ID data. Two contextual investigations of the dynamic confirmation are proposed. We hypothetically dissect their exceedingly expanded key space, which exponentially increased static key space in existing validation strategies. To assess execution of our structure, we manufactured a model framework and approve confirmation instrument tentatively. In tests, the proposed validation calculation demonstrated a 95% high precision rate inside various clients. In the reproduction part, we extensively think about the effect of tangible information test estimate and tactile information misfortune, which observed to be basic variables from investigations on confirmation calculation. Most re-enactment results approve our calculation successfully. Developing fame of electronically based verification in nearness get to control frameworks requires a higher security level and more noteworthy pervasiveness. We trust that validation bound with dynamic tangible data can adequately improved security dimension of access control frameworks and will make an essential stride towards electronically get to verification later on.

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