ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 5, Special Issue 1, January 2018

Attendance System Using Facial Recognition and Geolocation

Anuj Pant and Prakhar Saxena
Under the guidance of
Mr. R. Srinivasan and Ms. P. Mahalakshmi
Department of Computer Science and Engineering
S.R.M. University
Chennai, India

***Abstract*—Face recognition, one of the most successful applications of image understanding and analysis, has now startedgainingsignificantattention.Thefacerecognitionis acontroversialsubjectrightnow.Asystemsuchasthiscan recognizeandtrackdangerouscriminalsandterroristsina crowd, but some contend that it is an extreme invasion of privacy. Location Based Service (LBS) is critical to many businessesaswellasgovernmentorganizationstodrivereal insight from data tied to a specific location where activities take place. The spatial patterns that location-related data and services can provide is one of its most powerful and useful aspect where location is a common denominator in these activities and can be leveraged to better understand patterns and relationships. The prototype is used to mobilize as well as increase the authenticity of the existing attendance system by bringing the service directly to application environment. We provide a deep analysis atthe problem, draw conclusions and propose an efficient executable solution to tackle theseproblems.**

***Index Terms*—Facial Recognition, Location Based Services, Geolocation, Database Management System, Application, Application Programming Interface.**

I. INTRODUCTION

A. FacialRecognition

Afacerecognitionsystemisacomputerapplicationcapable of identifying or verifying a person from a digital image or a videoframefromavideosource.Asoneofthemostsuccessful applications of image analysis and understanding, face recognition has recently gained significant attention. Over the last ten years or so, it has become a popular area of research in computer vision and one of the most successful applications of imageanalysisandunderstanding.Oneofthewaystodothisis bycomparingselectedfacialfeaturesfromtheimageandaface database. Face biometrics have the potential to be integrated anywhere you can find a modern camera. Law enforcement agencies the world over use biometric software to scan facesin CCTV footage, as well as to identify persons of interest in the field.Bordercontroldeploymentsusefacerecognitiontoverify the identities of travelers. It even has consumerapplications. Facialrecognitiondoesn'tjustdealwithhardidentities,butalso can gather demographic data on crowds. This has made face biometrics solutions much sought after in the retail marketing industry. As a contactless biometric solution that's easy to deploy in consumer devices, face recognition is showing the publicjusthowconvenientstrongauthenticationcanbe.

B. Location BasedService

A location-based service (LBS) is a software-level service thatuseslocationdatatocontrolfeatures.AssuchLBSisan informationserviceandhasmanyusesinsocialnetworking today as information, in entertainment or security, which is accessible with mobile devices through the mobile network and which uses information on the geographical position of themobiledevice.LBSiscriticaltomanybusinessesaswell as government organizations to drive real insight from data tied to a specific location where activities take place. The spatial patterns that location-related data and services can provideisoneofitsmostpowerfulandusefulaspectwhere locationisacommondenominatorintheseactivitiesandcan beleveragedtobetterunderstandpatternsandrelationships. Geolocation is the identification or estimation of the real-world geographic location of an object, such as a radar source, mobile phone, or Internet-connected computer terminal. In its simplest form geolocation involves the generation of a set of geographic coordinates and is closely relatedtotheuseofpositioningsystems,butitsusefulnessis enhancedusingthesecoordinatestodetermineameaningful location,suchasastreetaddress.

II. OVERVIEW

The application's idea is general to all the organizations using attendance system for the employees but for sake of the demo, the university campus is taken as a sample workspace. Inside the campus, when it's time for classes to commence, we students generally observe the faculty members rushing to biometrics system area for marking their attendance and then going anywhere else. We thought, that it would be so convenient that the faculty have this power within their reach. This way they will save much time and energy, and efficient.

But the main issue was how to replace biometrics with somethingthat'salreadyincorporatedinthemobiledevices.The

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 5, Special Issue 1, January 2018

clearanswertothiswasthefrontcamerathattoday'sworlduser more than often than the back camera for selfies. The front camera can be used for facial recognition which is today's one ofthebesttoolforguaranteeingauthenticityoftheuser.

So, we thought of developing an app for this task. The app would scan the user's face and after successful facial recognition,theuserwillbeabletomarktheattendance.Butthe catch here is this, the user will be required to be present inside the campus premises. Only then he/she will be able to mark his/her attendance thus ensuring their physical presence inside thecampus.

III. SOLUTION

The project involves two technologies known as Facial Recognition and Geolocation. With these two together with Database Management System (DBMS), the project helps in markingattendanceoftheteacheronlywhenhe/sheisinsidethe campus.Thiswaytheauthenticityofthewholeprocessisfurther improvedontopoffacialrecognition.

The project aims at easing the lives of the teaching staff by providingthemwiththefacilitytomarktheirattendancerightat theirfingertips,withoutgoingtoaareadedicatedspecificallyfor biometrics recognition, thus saving them huge amount of time andenergy.

This way, teachers could easily scan their face, mark their attendancewherevertheyarewithinthecampuspremises.They must create an account and upload their face initially, but it's just a one-time process for initial setup. The faculty can also checktheirattendanceanytimetheywanttokeeptrackofit.

The attendance and all other credentials of the user issaved atour24-houronlinehostedserver,andiscompletelysecureand fast to access. Every action of the user inside the app is being kepttrackof,sothatthereisnochanceoffraudfromuserend.

Disclaimer: We are against stealing user's private information or any location details from their devices. We strongly promote user privacy, and thus do not save any user's information at our server.

IV. PROBLEMS

No matter how good the technology be, there is always a chanceofloopholeswhichneedstobecoveredgraduallyasthe technology is examined more thoroughly and checking every test case possible. Same can be said for this project. These are some of the minor loopholes that were found during the deployment of theproject:

- Facial recognition technique used here is dependenton a 2D surface and not upon the 3D model. So, a user's portrait or image on a flat surface when scanned, will produce a successfulresult.
- Sometimes it is possible to fake your currentlocation to some other location using some softwarehacks.

The above stated loopholes were encountered during the application development. The problem stated above,especially first, requires high amount of expertise in this field and huge amountofdeveloperstoconquerit.

At this moment, the 3D facial recognition is only used by Apple iPhone X in their device. Whilst, most of the other smartphone giants still use 2D facial recognition which can be bypassed using a photo.

V. WORKFLOW

Theapplicationstartswiththeuserenteringinthedetailsand his initial face scan if they are a new user, or else they can straight away login using their credentials they entered while creating their account. Once logged in, the application checks thecurrentlocationusingthebuiltinGPSsystemofthemobile phone and then calculates the distance compared to the pre entered co-ordinates of the campus. If the user is found to be withintheprescribedareaorcampus,he/sheiseligibletomark theattendance,orelsethecheck-inbuttonwillbedisableduntil theygetbackintothecampusarea.

Once checked-in the user can view their attendance percentagetillthedateallthewayfromtheirfirstdayofjoining. Thisparametercanbechangedtoamonthlyvieworweekly,as per the requirement of the institution. The attendance for the same is calculated using a virtual calendar created in our database.Thiscalendarcanbemodifiedaspertherequirements oftheinstitutiontofeedintheworkingdaysandthedayswhich maybemarkedasholidays.Accordinglytheattendanceofeach user ismarked.

While leaving, the user has to simply press the check-out button in the application and his out time will be marked while checking out, there is a minimum number of working hours required, as in our case 8 hours. If the user checks out early, he/she is asked for a valid reason, else the user may leave. In somecaseswhereintheusermayworkovertimeorevenforget to check-out and may come back the next day to check-in and realisethesame.Inthatcase,theattendancemayormaynotbe given to the user as per the decision of the institution and the case may be discussed with the Head of the Human Resources in order to apply for overtime or mark as regular working day. AsperthedecisiontheHRheadmayusetheirowninterfaceto make the required changes with respect to that candidate. The HRheadmayhaveaccesstotherecordsofalltheusersaswell have the rights to make changes with respect to those being partiallymarkedduetolongerenteredworkinghours.

ACKNOWLEDGMENT

We PrakharSaxena, and Anuj Pant, , would like to express ourgratitudetobothoutFacultyAdvisors,Ms.P.Mahalakshmi and Mr. R. Srinivasan as well as our Minor Project supervisor Mr. M. Senthil Raja for the guidance throughout the Project withoutwhosesupportthiswouldnothavebeenpossible.

Thisprojecthelpedustoincreaseourknowledgeinthefields ofDatabasehandlingaswellasonhowandroidapplicationsare developed. Also along the way we learnt an important lesson of the three D's of working Discipline, Determination and Devotionandhelpusthroughout.

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 5, Special Issue 1, January 2018

REFERENCES

The project was completed successfully with the help of the following references:

- www.Kairos.com
- www.Stackoverflow.com
- www.w3schools.com
- www.developer.android.com