Online Attendance System using Face Recognition

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Abstract

The goal of this project is to create the automated attendance system using face recognition. When a user takes a picture of a human, our application searches related information in a database using image recognition. Since a user of theapplication can take a picture under different circumstances, the used image recognition algorithm had to be invariant to changes in illumination and view point. The execution of the Algorithm what to run on the mobile phone, so there was needfor lightweight image recognition algorithm. A couple of these invariants can be grouped as a feature vector, identifying animage uniquely. By computing the distances between the vectors of an unknown image and known database images, a best match can be selected. Android is flexible and provides many tools for developing applications. This allowed to develop our museum guide application in a limited amount of time. We explored, evaluated and used many of Android's possibilities

Keywords: Authentication, Efficiency, Attendance, Andriod, Securit y, Verifiability

INTRODUCTION

In today's networked world, the need to maintain the security of information or physical property is becoming both increasingly important and increasingly difficult. From time to time we hear about the crimes of credit card fraud, computer breakin's by hackers, or security breaches in a company or government building. In most of these crimes, the criminals were taking advantage of a fundamental flaw in the conventional access control systems: the systems do not grant access by "who we are", but by "what we have", such as ID cards, keys, passwords, PIN numbers, or mother's maiden name. None of these means are really define us. Recently, technology became available to allow verification of "true" individual identity. This technology is based in a field called "biometrics". Biometric access control are automated methods of verifying or recognizing the identity of a living person on the basis of some physiological characteristics, such as fingerprints or facial features, or some aspects of the person's behavior, like his/her handwriting style or keystroke patterns. Since biometric systems identify a person by biological characteristics, they are difficult to forge. Face recognition is one of the few biometric methods that possess the merits of both high accuracy and low intrusiveness. It has the accuracy of a physiological approach without being intrusive. For this reason, since the early 70's (Kelly, 1970), face recognition has drawn the attention of researchers in fields from security, psychology, and image processing, to computer vision.

1. PURPOSE

Face recognition is one of the few biometric methods that possess the merits of both high accuracy and low intrusiveness. It has the accuracy of a physiological approach without being intrusive. Over past 30 years, many researchers have proposed different face recognition techniques, motivated by the increased number of

real world applications requiring the recognition of human faces. There are several problems that make automatic face recognition a very difficult task. However, the face image of a person inputs to the database that is usually acquired under different conditions. The important of automatic face recognition is much be cope with numerous variations of images of the same face

1. 1EXISTING SYSTEM

Face recognition technology is well advance that can applied for many commercial applications such as personal identification, security system, image- film processing, psychology, computer interaction, entertainment system, smart card, law enforcement, surveillance and so on. Face recognition can be done in both a still image and video sequence which has its origin in still-image face recognition.

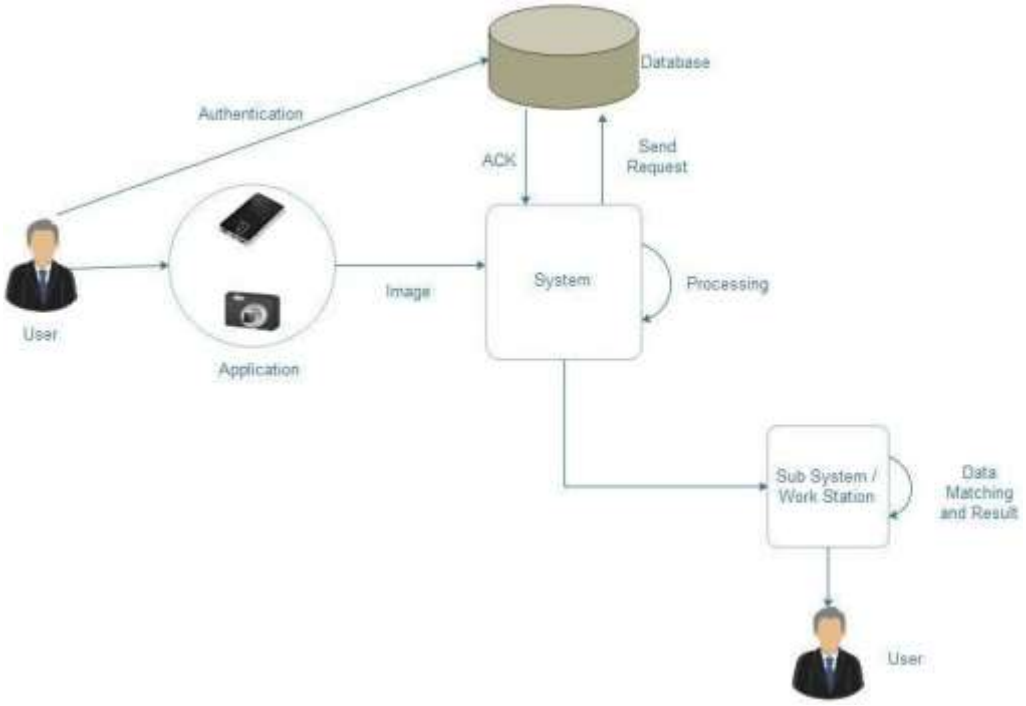
2. DRAWBACKS OF EXISTING SYSTEM

- **Less User Friendly:** The existing system is not user friendly because the retrieval of day-to-day activities data/records isvery slow and records are not maintained efficiently and effectively.

- **Lengthy time:** Every work is done manually so we cannot generate report in the middle of the session or as per therequirement because it is very time consuming.

3. SYSTEM ARCHITECTURE

Fig -1: System Architecture Diagram



Mathematical Model

1. System Description :
2. S = (I,O,F)
3. Where, S: System.
4. I = I1, I2, I3 are set of Inputs
5. Where,

6. I1 : ID
7. I2 : Face Scan
8. I3 : Storing Information
9. F = F1, F2 are set of Functions
10. Where,
11. F1 : Process
12. F2 : Check Data
13. O = O1 are set of Output
14. where,
15. O1 : Attendance Successfully

16. • Success Condition : To proper feature extraction, Proper requirements.
17. • Failure Condition : No Database, No Internet Connection.

Algorithm

SVM Mastering machine learning algorithms isn't a myth at all. Most of the beginners start by learning regression. It is simple to learn and use, but does that solve our purpose? Of course not! Because you can do so much more than just Regression! Think of machine learning algorithms as an armory packed with axes, sword, blades, bow, dagger, etc. You have various tools, but you ought to learn to use them at the right time. As an analogy, think of 'Regression' as a sword capable of slicing and dicing data efficiently, but incapable of dealing with highly complex data. On the contrary, 'Support Vector Machines' is like a sharp knife –it works on smaller datasets, but on the complex ones, it can be much stronger and powerful in building machine learning models.

n machine learning, support-vector machines (SVMs, also support-vector networks) are supervised learning models with associated learning algorithms that analyze data used for classification and regression analysis. Given a set of training examples, each marked as belonging to one or the other of two categories, an SVM training algorithm builds a model that assigns new examples to one category or the other, making it a non-probabilistic binary linear classifier (although methods such as Platt scaling exist to use SVM in a probabilistic classification setting). An SVM model is a representation of the examples as points in space, mapped so that the examples of the separate categories are divided by a clear gap that is as wide as possible.

New examples are then mapped into that same space and predicted to belong to a category based on the side of the gap on which they fall. In addition to performing linear classification, SVMs can efficiently perform a non-linear classification using what is called the kernel trick, implicitly mapping their inputs into high dimensional feature spaces. When data are unlabelled, supervised learning is not possible, and an unsupervised learning approach is required, which attempts to find natural clustering ofthe data to groups, and then map new data to these formed groups. The support-vector clustering algorithm, created by Hava Siegelmann and Vladimir Vapnik, applies the statistics of sup port vectors, developed in the support vector machines algorithm, to categorize unlabeled data, and is one of the most widely used clustering algorithms in industrial.

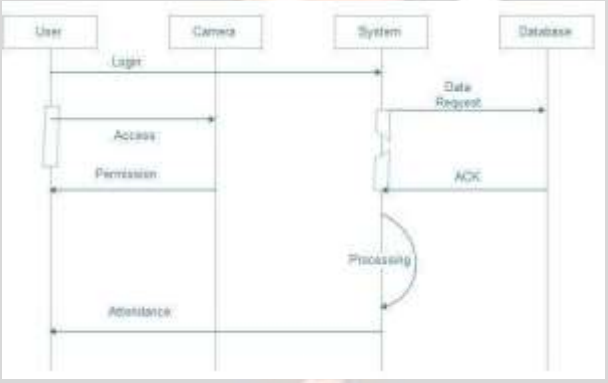
OpenCV : OpenCV (Open source computer vision) is a library of programming func tions mainly aimed at real-time computer vision. Originally developed by Intel, it was later supported by Willow Garage then Itseez (which was later acquired by Intel). The library is cross-platform and free for use under the open-source BSD license. OpenCV supports some models from deep learning frameworks like TensorFlow, Torch, Online Attendance System Using Face Recognition 34 PyTorch (after converting to
an ONNX model) and Caffe according to a defined list of supported layers.. It promotes OpenVisionCapsules, which is a portable format, compatible with all other formats. Officially launched in 1999 the OpenCV project was initially an Intel Research initiative to advance CPU-intensive applications, part of a series of projects including real-time ray tracing and 3D display walls. The main contributors to the project included a number of optimization experts in Intel Russia, as well as Intel's Performance Library Team. In the early days of OpenCV, the goals of the project were described as: Advance vision research by providing not only open but also optimized code for basic vision infrastructure. No more reinventing the wheel. Disseminate vision knowledge by providing a common infrastructure that developers could build on, so that code would be more readily readable and transferable. Advance vision-based commercial applications by making portable, performance-optimized code available for free – with a license that did not require code to be open or free itself. The first alpha version of OpenCV was released to the public at the IEEE Conference on Computer Vision and Pattern Recognition in 2000, and five betas were released between 2001

and 2005. The first 1.0 version was released in 2006. A version 1.1 ”pre-release” was released in October 2008. The second major release of the OpenCV was in October 2009. OpenCV 2 includes major changes to the C++ interface, aiming at easier, more type-safe patterns, new func tions, and better implementations for existing ones in terms of performance (especially on multi-core systems). Official releases now occur every six months[7] and development is now done by an independent Russian team supported by commercial corporations. In August 2012, support for OpenCV was taken over by a non-profit foundation OpenCV.org, which maintains a developer[8] and user site.[9]

ADVANTAGES

18. Easiest method to keep track of attendance.
19. Provides accurate attendance of the students.
20. Proxy attendance is completely eradicated by this system.
21. There are no physical interactions with the system.
22. Outsiders can be easily detected.
23. Very feasible and time saver application.
24. Manual work can be avoided.
25. Easy to list out detent students.

SEQUENCE DIAGRAM



APPLICATIONS

1. The system can be used in educational institutes, Universities, courses etc.
2. It can also be used in Government offices.
3. IT companies.
4. It can be use all the places where attendance is mandatory like hospital staff, company staff etc.

5. CONCLUSION

We conclude image processing based Student Attendance system using Mobile Camera using Android studio as software for image processing and attendance is provided to the teachers through the mobile application. We can track the attendance of the students by using the language python, which is very easy to install and is open source software and can be used in real time application in a quick manner. In this project we have shown the capturing of the students, in the class by using camera of mobile. This proposedsystem reduces the possibilities of proxy attendance of the students, who were not present in the class and reduces the time. The input image is give to the system for image processing system compare the faces detected by camera with photos stored in thee database. System creates the attendance sheet of present student.

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