



3-D HAND GEOMETRY WITH ATTENDANCE SYSTEM BASED RECOGNITION SYSTEM FOR USER AUTHENTICATION USING IMAGE PROCESSING

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Keywords: *Biometric, Sensor, Hand-Geometry, Authentication, Verification.*

Abstract - Biometrics which can be used for identification of individuals based on their physical or behavioural characteristics has gained importance in today's society where information security is essential. Hand geometry based biometrics systems are gaining acceptance in low to medium security applications. Hand geometry based identification systems utilize the geometric features of the hand like length and width of the fingers, diameter of the palm and the perimeter. The proposed system is a verification system which utilizes these hand geometry features for user authentication. This project introduces an inexpensive, powerful and easy to use hand geometry based biometric person authentication system. One of the novelties of this work comprises on the introduction of hand geometry's related, position independent, feature extraction and identification which can be useful in problems related to image processing and pattern recognition. Today students' (class) attendance became more important part for any organizations/institutions. The conventional method of taking attendance by calling names or signing on paper is very time consuming and insecure, hence inefficient. This paper presents the manual students' attendance management into computerized system for convenience or data reliability. So, the system is developed by the integration of ubiquitous computing systems into classroom for managing the students' attendance using palm print scanner. The system is designed to implement an attendance management system based on palm print scanner which students need to use their palm to success the attendance where only authentic student can be recorded the attendance during the class. This system takes attendance electronically with the help of the webcam, and the records the attendance in a database. Students' roll call percentages and their details are easily seen via Graphical User Interface (GUI).

1. INTRODUCTION

The renewed interest in digital identity of people has opened up several areas of biometric analysis which in the past received less attention. These areas include hand geometry, 3D geometry and analysis of finger structures. Many characteristics of human beings are used for identification of which fingerprints, voice and face have been the most prominent. Electronic methods also use voice, face, iris and hand features to provide unique keys for people identification. Machines are very limited in terms of their capability to recognise human beings from their hands alone. This limitation is human limitation in the representation and selection of appropriate features. Fingerprint features have been used for decades and biometrics systems based on fingerprints and face features have been in the market the last few years and are gradually gaining acceptance. Despite acceptance of fingerprint access systems, the management of digital identity across distributed networks require more than one metric to provide high identification reliability and low failure rate authentication.

In real life, many of the bio metric systems can be defeated. Therefore, the more the number of biometrics applied for identification of a subject, the better the reliability of the system and certainty of recognition. As for system development and implementation, it should be able to help the lecturers to managing their student attendance systematically. The system must have database that contains student information and it must be able to help lecturer to manipulate data, update database.

2. OBJECTIVE

- This project introduces an inexpensive, powerful and easy to use hand geometry based biometric person authentication system.
- Hand geometry based biometrics systems are gaining acceptance in low to medium security applications.
- One of the novelties of this work comprises on the introduction of hand geometry's related,

3. Algorithm

LR: parser is a bottom-up parser for context-free grammar that is very generally used by computer programming language compiler and other associated tools. LR parser reads their input from left to right and produces a right-most derivation. It is called a Bottom-up parser because it attempts to reduce the top-level grammar productions by building up from the leaves. LR parsers are the most powerful parser of all deterministic parsers in practice. LR Parsing algorithm is the same for all the parser, but the parsing table is different for each parser. It consists following components as follows. Input Buffer – It contains the given string, and it ends with a symbol. Stack – The combination of state symbol and current input symbol is used to refer to the parsing table in order to take the parsing decisions.

4. MOTIVATION

- Significant discriminatory information. (Combination of 2-D and 3-D features).
- Contactless hygienic method.
- Improved performance.
- Difficult to forge or counterfeit
- To save the time of taking attendances for student

5. LITERATURE SURVEY

1.Paper Name:Human Palm Geometry Modelling for Biometric Security Systems.

Author:Johnson I Agbinya.

Abstract :Palm print modelling and recognition systems have been extensively studied. Palm shape or palm geometry has had lesser attention paid to its study because of the difficulties associated with shape definitions and modelling. This paper reports on experimental determination of human palm geometry equations. Experimental determination of human palm geometry was undertaken using measurements of hands of 14 subjects drawn from a mixture of racial and gender backgrounds. By also analysing scanned images of their hands, characteristic measurements of their palms were determined. Characteristic expressions describing the geometry of human hands are proposed. The equations are based on measurements of various parts of the hand cross a broad spectrum of female and male representatives of various ethnic groups. They describe the relationships between the lengths of the hands and their perimeters at the finger tips and the base of the fingers. The relationships lead to a unique expression called the hand geometry equation.

2.Paper Name:”An Augmented Reality Application with Hand Gestures for Learning 3D Geometry. ”

Author: Hong-Quan Le, Jee-In Kim.

Abstract :— Geometry is an interesting area of mathematics. It opens to many different approaches and closely relates to our everyday lives. However, when students recall their experiences of learning geometry, many of them regards it as not only unpleasant experiences but often also difficult experiences. The traditional materials and tools such as pens, papers, blackboards, textbooks and/or classical methodologies like drawing, narrative teaching stills cannot be regarded as a great support for students who learn geometry. In this paper, we propose a framework for learning geometry using a software tool based on augmented reality (AR) [1] and hand gestures recognition technologies [2]. These technologies are combined into a system that can address some current issues in geometry education and provide students with an easier way for studying geometry.

3.Paper Name: Haptic Rendering of 3D Geometry on 2D Touch Surface Based on Mechanical Rotation.

Author:Seung-Chan Kim, Byung-Kil Han , Dong-Soo Kwon
Abstract :In this paper, we present a robotic surface display that physically imitates the orientation of virtual 3D geometry touched through a 2D flat screen. The proposed approach renders the surface orientation of 3D geometry such that users can tactually obtain relative geometric information, which plays a significant role in the process of real-world haptic object perception. Taking advantage of the planar aspect of touch surfaces, the system constructs a rotation matrix to control the pose of a surface with minimal mechanical movements with given partial geometric information (i.e., normal vector at the point of touch). To evaluate the proposed rendering scheme, we conducted a geometric task (two alternative forced choices) with a set of hand-sized cylindrically curved geometries in which participants were asked to identify which of the two surfaces they perceived as being more curved.

4.Paper Name: Hand Control AR: An Augmented Reality Application for Learning 3D Geometry.

Author:Rui Cao, Yue Liu.

Abstract :— The traditional way of learning geometry cannot provide a great support for novice students since the geometric figures are 2D on the blackboard or the book. In consideration that Augmented Reality(AR) provides an intuitive way to learn geometry, an interactive AR system that enables students to naturally and directly manipulating 3D objects through hand gesture-based interactions and intuitively explore the spatial relationship between spheres and polyhedrons is proposed in this paper. The proposed gesture-based interaction enables the user manipulate AR objects in the real 3D space instead of 2D space. We design three levels of study to enable students to learn the geometric concepts as well as an experiment to evaluate the effectiveness of the AR system. Analysis of experimental results showed that the proposed system is easy to use, attractive, and helpful for students

5. Paper Name:Reconstructing 3D Shapes From Multiple Sketches Using Direct Shape Optimization.

Author:Baorui Ma, Yu-Shen Liu

Abstract:— 3D shape reconstruction from multiple hand-drawn sketches is an intriguing way to 3D shape modeling.

Currently, state-of-the-art methods employ neural networks to learn amapping from multiple sketches from arbitrary view angles to a 3D voxel grid. Because of the cubic complexity of 3D voxel grids ,however, neural networks are hard to train and limited to low resolution reconstructions, which leads to a lack of geometric detail and low accuracy. To resolve this issue, we propose to reconstruct 3D shapes from multiple sketches using direct shape optimization (DSO).

6. SYSTEM OVERVIEW

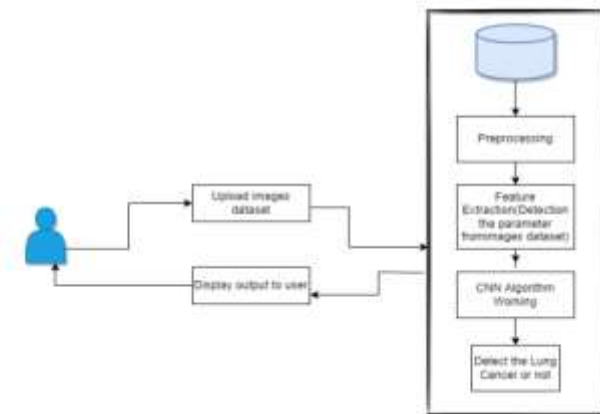


Figure 1. system Architecture

• Module • Admin

In this module,the Admin has to log in by using valid user name and password.After login successful he can do some operations such as View All Users and Authorize, View All E-Commerce Website and Authorize,View All Products and Reviews,View All Products Early Reviews, View All Keyword Search Details, View All Products Search Ratio, View All Keyword Search Results,View All Product Review Rank Results.

• View and Authorize Users

In this module, the admin can view the list of users who all registered. In this,the admin can view the user's details such as, user name, email, address and admin authorizes the users.

• View Charts Results

View All Products Search Ratio,View All Keyword Search Results,View All Product Review Rank Results.

• Ecommerce User

In this module, there are n numbers of users are present. User should register

before doing any operations. Once user registers, their details will be stored to the database. After registration successful,he has to login by using authorized user name and password Once Login is successful user will do some operations like Add Products, View All Products with reviews, View All Early Product's reviews, View All Purchased Transactions.

• End User

In this module, there are n numbers of users are present. User should register

before doing any operations. Once user registers, their details will best or to

the database. After registration successful,he has to login by using authorized

user name and password. Once Login is successful user will do some operations like Manage Account, Search Products by keyword and Purchase, View Your Search Transactions, View.

7. CONCLUSIONS

This project has presented a new approach to achieve more reliable personal authentication using simultaneous extraction and combination of 3D and 2D hand geometry features. The proposed system acquires hand images in a contact –free manner to ensure high user friendliness and also to address the hygienic concerns. Simultaneously acquired range and 2D images of the hand are processed for the feature extractionand matching. We introduced two new representations, namely finger surface curvature and unit normal vector, for 3D hand geometry based biometric measurement. Simple and efficient metrics are proposed for the matching of pair of 3D hand images. Match scores from 3D and 2D hand geometry matchers are combined to obtain a highly reliable authentication system. Our research also suggests that significant performance improvement can be achieved by combining hand geometry information extracted from user's 2D and 3D hand images.we discussed the way to measure the attendance of students. A preliminary experiment demonstrates a teacher can classify any student's attendance according to their use.Any teacher can take the records and generate graph according to their use.

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