



ATM SECURITY USING FACE RECOGNITION

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Abstract

The growth in the electronic transactions has resulted in a greater demand for fast and accurate user identification and authentication. User have been largely depending on and trusting the Automatic Teller Machine (ATM) to conveniently meeting their banking needs . However, numerous advantages of ATM system, the ATM fraud has recently become more widespread. This system used to avoid the ATM robberies and wrong person miss uses the ATM. So we proposed things such as sounds and actions of Breaking or damaging the machines threatening the ATM users denial of transactions and any other ATM user by invalid users or mask.

INTRODUCTION

With the technological advances in financial infrastructure, most bank customers prefer to use Automatic Teller Machines (ATMs) and Internet websites for carrying out their banking transactions. Financial users especially utilize ATMs for physical transactions like cash withdrawal or cash deposit. However, just like any other system, ATMs are also suffering from numerous issues caused by users. Among these problems, card and/or cash forgetting (CCF) is a common issue. The main goal of our work is to propose a computer vision framework which uses the embedded ATM camera to perform face detection and recognition in order to prevent such unnecessary losses generated by CCF. In the studied scenario, we consider the case where a customer withdraws money from an ATM in a conventional setting. After the customer inserts the card into the ATM, the proposed system starts to perform face detection and builds a temporary face database for the customer using the camera located inside the ATM. If the customer leaves the ATM without taking his/her card or cash, the ATM waits for the customer to

be back instead of retracting the forgotten item. If the system finds out there is a different customer approaching the ATM before the card/cash holder, the card/cash will be retracted at that moment. This scenario is fundamentally different than biometric authentication scenarios, in which a person's image is matched to a gallery image acquired, possibly, a long time before the matching, under different conditions. In this scenario, the matching image and the gallery image are separated by mere minutes at most.

IMPROVING ATM SECURITY VIA FACE RECOGNITION

A facial recognition system is a computer application for automatically identifying or verifying a person from a digital image or a video frame from a video source. Proposed paper uses face recognition technique for verification in ATM system. For face recognition, there are two types of comparisons. The first is verification, this is where the system compares the given individual with who that individual says they are and gives a yes or no decision. The next one is identification this is where the system compares the given individual to all the other individuals in the database and gives a ranked list of matches. Face recognition technology analyzes the unique shape, pattern and positioning of the facial features. Face recognition is very complex technology and is largely software based. This Biometric Methodology establishes the analysis framework with PCA algorithms for each type of biometric device. Face recognition starts with a picture, attempting to find a person in the image. This can be accomplished using several methods including movement, skin tones, or blurred human shapes.

SHORT TERM FACE RECOGNITION FOR AUTOMATIC TELLER MACHINE (ATM) USERS

Automatic Teller Machines (ATMs) are widely used in our daily lives due to their convenience,

wide-spread availability and time-independent operation. Automatic retraction of forgotten card or cash by ATMs is a problem with serious consequences (lost time and money), typically caused by user inattention/negligence. In this work, we propose a scheme in which the retraction rate of an ATM is decreased using face detection and recognition methods via ATM's built-in camera. The short time frame of ATM usage and severe motion artifacts make this problem very different from an ordinary face authentication or face recognition problem. We evaluate the proposed system under challenging conditions of real ATM usage. The experimental results on multiple databases reveal that our proposed system is promising for mitigating card/cash forgetting issue and improving ATM user experience.

FACE DESCRIPTION WITH LOCAL BINARY PATTERNS: APPLICATION TO FACE RECOGNITION

This paper presents a novel and efficient facial image representation based on local binary pattern (LBP) texture features. The face image is divided into several regions from which the LBP feature distributions are extracted and concatenated into an enhanced feature vector to be used as a face descriptor. The performance of the proposed method is assessed in the face recognition problem under different challenges. Other applications and several extensions are also discussed.

COMPARATIVE STUDY OF TEXTURE MEASURES WITH CLASSIFICATION BASED ON FEATURE DISTRIBUTIONS

This paper evaluates the performance both of some texture measures which have been successfully used in various applications and of some new promising approaches proposed recently. For classification a method based on Kullback discrimination of sample and prototype distributions is used. The classification results for single features with one-dimensional feature value distributions and for pairs of complementary features with two-dimensional distributions are presented.

MULTI RESOLUTION GRAY-SCALE AND ROTATION INVARIANT TEXTURE CLASSIFICATION WITH LOCAL BINARY PATTERNS

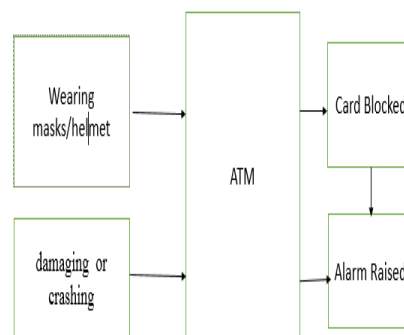
The proposed approach is very robust in terms of gray-scale variations since the operator is, by definition, invariant against any monotonic

transformation of the gray scale. Another advantage is computational simplicity as the operator can be realized with a few operations in a small neighborhood and a lookup table. Excellent experimental results obtained in true problems of rotation invariance, where the classifier is trained at one particular rotation angle and tested with samples from other rotation angles, demonstrate that good discrimination can be achieved with the occurrence statistics of simple rotation invariant local binary patterns. These operators characterize the spatial configuration of local image texture and the performance can be further improved by combining them with rotation invariant variance measures that characterize the contrast of local image texture. The joint distributions of these orthogonal measures are shown to be very powerful tools for rotation invariant texture analysis.

ADVANTAGES:

- ATM security model that would increasing the performance combine a physical access card, a PIN, and face recognition to increase the reliability of ATM transactions.
- Finding the valid or invalid user and Avoiding the wrong person to accesses the ATM.
- Wrong person wearing mask and have any object he didn't get cash and blocked.

ARCHITECTURE DIAGRAM:



The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The

design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. Input Design considered the following things:

- What data should be given as input?
- How the data should be arranged or coded?
- The dialog to guide the operating personnel in providing input.
- Methods for preparing input validations and steps to follow when error occur.

OUTPUT DESIGN

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making. The output form of an information system should accomplish one or more of the following objectives.

- ❖ Convey information about past activities, current status or projections of the
- ❖ Future.
- ❖ Signal important events, opportunities, problems, or warnings.
- ❖ Trigger an action & Confirm an action

Module description:

Preprocessing: After cropping out the face region, we performed histogram equalization so as to avoid illumination change. Then an ellipse-shaped mask is used to remove some of the corner regions such as the collar, for reducing the unnecessary effects of these regions. The masking step, however, is not employed for the detected out-of-session face images since the images are of low quality and have small size.

Feature extraction:

After the preprocessing step, the Local Binary Pattern (LBP) operator is used for our face description. LBP is one of the best performing texture descriptors and it has been widely used in various applications. It is proven to be highly discriminative and its key advantages, namely,

its invariance to monotonic gray-level changes and computational efficiency, make it suitable for demanding image analysis tasks.

Verification System:

Its used to verify the user face and body recognition and compare sample gallery then its give valid results to make correct decision its verifies the valid user or invalid user using the frontal face images captured by an embedded ATM camera.

Object Detection:

This module is used to detect the user may be wear mask and have any object(strike , gun , knife) using OpenCV's built-in Haar cascade profile face detector.

User wearing big mask incase using best rotation angle for maximizing the face detection.

Security Measures of ATMS:

- Measuring the face and body recognition using the frontal face images captured by an embedded ATM camera. Its detect the wrong person suddenly block the card and rising the alarm.
- **Virtual keyboard**
- **Alarm sensor**

Virtual keyboard:

Virtual keyboards can be categorized by the following aspects:

- Physical keyboards with distinct keys comprising electronically changeable displays integrated in the keypads
- Virtual keyboards with touchscreen keyboard layouts or sensing areas
- Optically detected human hand and finger motions
- Online virtual keyboards for multiple languages that don't require OS settings change

CONCLUSION

To avoid atm robberies and provide security for atm, To secure such a complex system will be even more difficult than design it. And now people just begin to discuss some issues of ATM security. It will provide some experience for us to implement security services in ATM network

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