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FVA SECURITY ALARM SYSTEM IN BORDER MONITORING FOR INDIAN ARMY

D.Roshana sherine, A.Seetha lakshmi, V.Vishnu priya

***Abstract*— we propose a method of personal identification based on finger-vein patterns and face images. An image of a finger captured under infrared light contains not only the vein pattern but also irregular shading produced by the various thicknesses of the finger bones and muscles with fusion process on face image features. The project deals with the data receiving from sensor nodes without any delay. The data receiving time is increased with the mobile communication. The project deals with the data receiving from sensor nodes without any delay. The data receiving time is increased with the mobile communication. The section runs with LPC2148 as master node to which sensors are connected. Communications between the military section and robot section -vein patterns and face images. This sensor node is composed of a micro-processors, transceivers, displays and analog to digital converters. Sensor nodes are deployed for military process monitoring and control.**

***Index Terms*— PIR sensor, ARM 7, ultrasonic sensor, metal detector, mems, face and vein module,zigbee.**

I. INTRODUCTION

A system is something that maintains its existence and functions as a whole through the interaction of its parts. E.g. Body, Mankind, Access Control, etc A system is a part of the world that a person or group of persons during some time interval and for some purpose choose to regard as a whole, consisting of interrelated components, each component characterized by properties that are selected as being relevant to the purpose. Embedded System is a combination of hardware and software used to achieve a single specific task.

Embedded systems are computer systems that monitor, respond to, or control an external environment. Environment connected to systems through sensors, actuators and other I/O interfaces. Embedded system must meet timing & other constraints imposed on it by environment. An embedded system is a microcontroller-based, software driven, reliable, real-time control system, autonomous, or human or network interactive, operating on diverse physical variables and in

Diverse environments and sold into a competitive and cost conscious market. An embedded system is not a computer system that is used primarily for processing, not a software system on PC or UNIX, not a traditional business or scientific application. High-end embedded & lower end embedded systems. High-end embedded system - Generally 32, 64 Bit Controllers used with OS. Examples Personal Digital Assistant and Mobile phones etc .Lower end embedded systems - Generally 8,16 Bit Controllers used with an minimal operating systems and hardware layout designed for the specific purpose. Examples Small controllers and devices in our everyday life like Washing Machine, Microwave Ovens, where they are embedded in.

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***D.Roshana sherine**, Electronic and communication engineering, S.A.Engineering college., Chennai ,India., 9566185229.,*

***A.Seethalakshmi**, Electronic and communication engineering, S.A.Engineering college, Chennai, India, 9940173177.*

***V.Vishnupriya** , Electronic and communication engineering, S.A.Engineering college., Chennai ,India., 9094529955.,*

II. RELATED WORK

Author [1] Nalini the current rapid growth in multimedia technology, there is an imminent need for efficient techniques to search and query large image databases. Because of their unique and peculiar needs, image databases cannot be treated iri a similar fashion to other types of digital libraries. The contextual dependencies present in images, and the complex nature of two-dimensional image data make the representation issues more difficult for image databases. An invariant representation of an image is still an open research issue. For these reasons, it is difficult to find a universal content-based retrieval technique. Current approaches based on shape, texture, and color for indexing image databases have met with limited success. Further, these techniques have not been adequately tested in the presence of noise and distortions. A given application domain offers stronger constraints for improving the retrieval performance. Fingerprint databases are characterized by their large size as well as noisy and distorted query images. Distortions are very common in fingerprint images due to elasticity of the skin. In this paper, a method of indexical large fingerprint image databases is presented. The approach integrates a number of domain-specific high-level features such as pattern class and ridge density at higher levels of the search. At the lowest level, it incorporates elastic structural feature-based matching for indexing the database. With a multilevel indexing approach, we have been able to reduce the search space.

Author [2] **dyadic** wavelet transform is adopted to extract finger-vein pattern from finger images, which are not only contain vein pattern but also shading and noise. Images are transformed from spatial domain to wavelet domain, and wavelet coefficients of the vein patterns and the noise are processed by soft-thresholding denoising method, which can recover the vein pattern from noisy data. Then compute modified moment invariants of the reconstruction images as the vein pattern feature to represent the vein pattern features. Vein pattern features matching bases on Hands-off distance. Experiment results show that this method is stabile and fast for extracting vein pattern from noisy data.

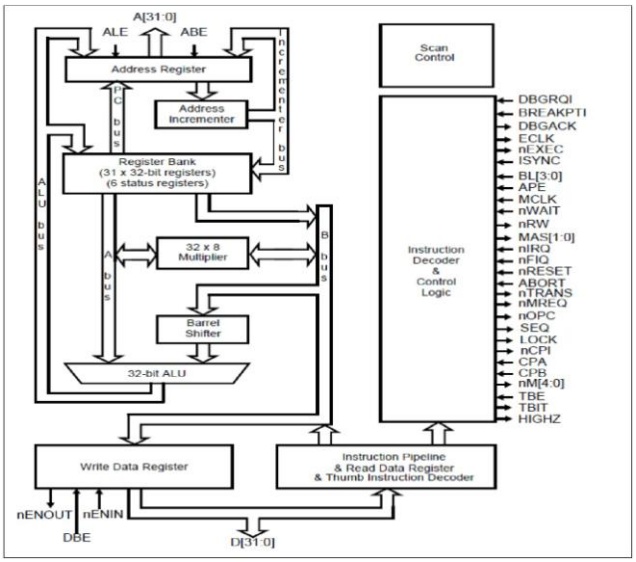
III. PROPOSED SYSTEM

In addition to the existing system the face and vein recognition is included in proposed one. This reduces the time delay communication between the robot section and the monitoring section. High accuracy is maintained in this process. The intensity and sound measurement is accurate. As the manual monitoring can be easily broken so robot is used to give information with accuracy .the power consumption is low in this process of monitoring.

IV. ARM TDMI

The ARM7 family includes the ARM7TDMI, ARM7TDMI-S, ARM720T, and ARM7EJ-S processors. The ARM7TDMI core is the industry's most widely used 32-bit embedded RISC microprocessor solution. Optimized for cost and power-sensitive applications, the ARM7TDMI solution provides the low power consumption, small size, and high performance needed in portable, embedded applications. The ARM7TDMI-S core is the synthesizable version of the ARM7TDMI core, available in both VERILOG and VHDL, ready for compilation into processes supported by in-house or commercially available synthesis libraries. Optimized for flexibility and featuring an identical feature set to the hard macro cell, it improves time-to-market by reducing development time while allowing for increased design flexibility, and enabling >>98% fault coverage. The ARM720T hard macro cell contains the ARM7TDMI core, 8kb unified cache, and a Memory Management Unit (MMU) that allows the use of protected execution spaces and virtual memory. This macro cell is compatible with leading operating systems including Windows CE, Linux, palm OS, and SYMBIAN OS.

The ARM7EJ-S processor is a synthesizable core that provides all the benefits of the ARM7TDMI – low power consumption, small size, and the thumb instruction set – while also incorporating ARM's latest DSP extensions and Jazelle technology, enabling acceleration of java-based applications. Compatible with the ARM9™, ARM9E™, and ARM10™ families, and Strong-Arm® architecture software written for the ARM7TDMI processor is 100% binary-compatible with other members of the ARM7 family and forwards-compatible with the ARM9, ARM9E, and ARM10 families, as well as products in Intel's Strong ARM and xscale architectures.
This gives designers a choice of software-compatible processors with strong price-performance points. Support for the ARM architecture today includes:
Operating systems such as Windows CE, Linux, palm OS and SYMBIAN OS. More than 40 real-time operating systems, including qnx, wind river's vx works and mentor graphics.



The ARM7TDMI core uses a three-stage pipeline to increase the flow of instructions to the processor. This allows multiple simultaneous operations to take place and continuous operation of the processing and memory systems. The ARM7TDMI memory interface is designed to allow optimum performance potential and minimize memory usage. Speed critical control signals are pipelined to allow system control functions to exploit the fast-burst access modes supported by many memory technologies. The ARM instruction set allows a program to achieve maximum performance with the minimum number of instructions. The simpler thumb instruction set offers much increased code density reducing memory requirement. Code can switch between the ARM and thumb instruction sets on any procedure call. All exceptions have banked registers for R14 and R13. After an exception, R14 holds the return address for exception processing. This address is used both to return after the exception is processed and to address the instruction that caused the exception. R13 is banked across exception modes to provide each exception handler with a private stack pointer.
The fast interrupt mode also banks registers 8 to 12 so that interrupt processing can begin without the need to save or restore these registers. All ARM instructions are conditionally executed and can optionally update the four condition code flags (Negative, Zero, Carry, and Overflow) according to their result. Fifteen conditions are implemented.

V. FACE VEIN DETECTION

Facial recognition methods are generally regarded as a pretty reliable method of biometric identification. Here facial and vein recognition is done by infrared light of irregular pattern.

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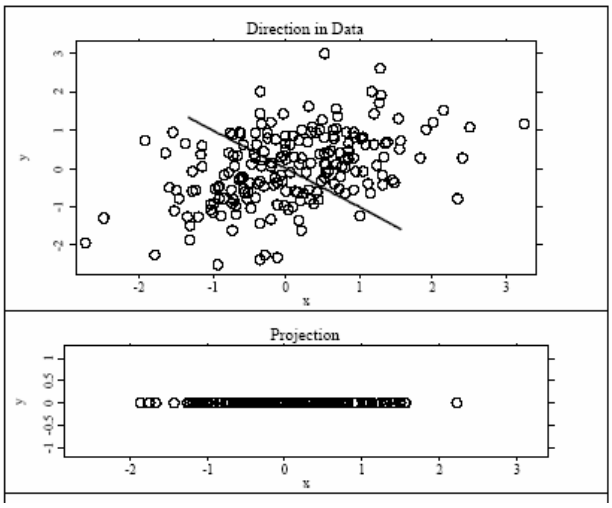
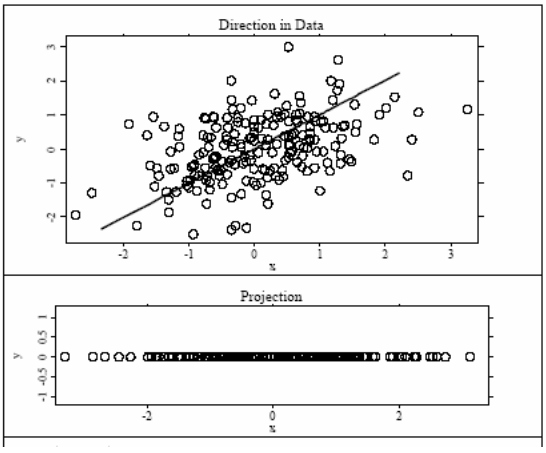
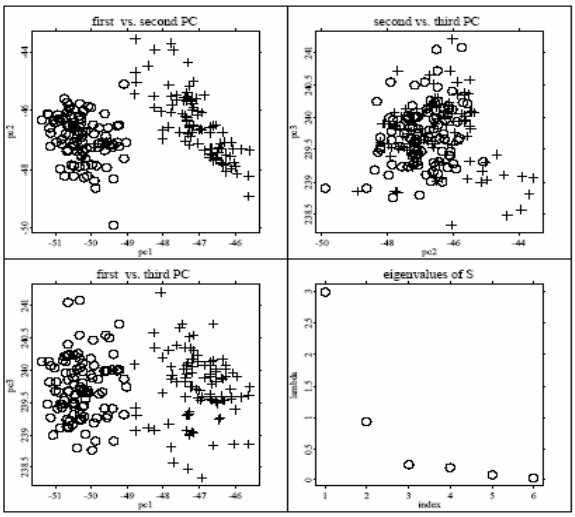
We typically have a data matrix of n observations on p correlated variables $x_1,x_2,...x_p$. PCA looks for a transformation of the x_i into p new variables y_i that are uncorrelated.The simplet way is to keep one variable and discard all others: not reasonable! Wheigt all variable equally: not reasonable (unless they have same variance). Wheigted average based on some citerion. The direction of $\boldsymbol{\delta}$ is given by the eigenvector $\boldsymbol{\gamma_1}$ correponding to the largest eigenvalue of matrix **C**.The second vector that is orthogonal (uncorrelated) to the first is the one that has the second highest variance which comes to be the eignevector corresponding to the second eigenvalue. New variables Y_i that are linear combination of the original variables (x_i):$Y_i = a_{i1}x_1+a_{i2}x_2+...a_{ip}x_p$; $i=1..p$

The new variables Y_i are derived in decreasing order of importance; they are called 'principal components'. The new variables (PCs) have a variance equal to their corresponding eigenvalue. $Var(Y_i)= \lambda_i$ for all $i=1...p$ Small λ_i ⇔ small variance ⇔ data change little in the direction of component Y_i

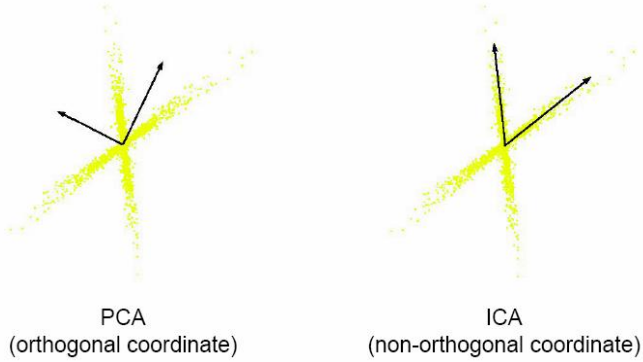
The relative variance explained by each PC is given by $l_i / \Sigma l_i$

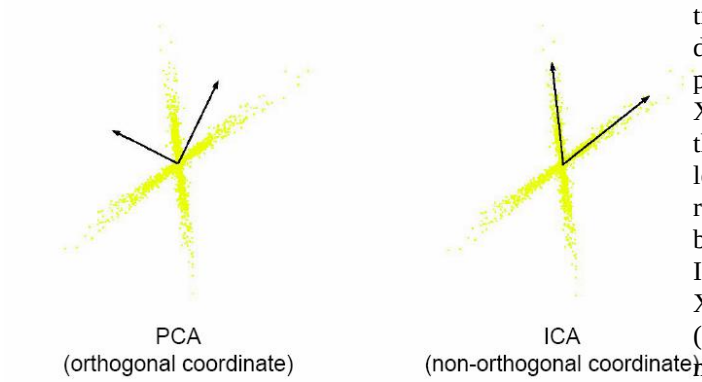






See the wheights of variables in each component If $Y_1= 0.89 X_1 +0.15X_2-0.77X_3+0.51X_4$ Then X_1 *and* X_3 have the highest wheights and so are the mots important variable in the first PC See the correlation between variables X_i and PCs: circle of correlation. It is not a dimensionality reduction technique. There is no single (exact) solution for components; uses different algorithmes (in R: FastICA, PearsonICA, MLICA) ICs are of course uncorrelated but also as independent as possible. Uninteresting for Normally distributed variables.
The vein pattern is verified with the database already stored. After verification the person is found whether authorized.





transfer. Its low power consumption limits transmission distances to 10–100 meters line-of-sight, depending on power output and environmental characteristics. The XBee/XBee-PRO RF Modules are designed to operate within the ZigBee protocol and support the unique needs of low-cost, low-power wireless sensor networks. The modules require minimal power and provide reliable delivery of data between remote devices. The modules operate within the ISM 2.4 GHz frequency band and are compatible. The XBee modules were designed to mount into a receptacle (socket) and therefore do not require any soldering when mounting it to a board. The XBee-PRO Development Kits contain RS- 232 and USB interface boards which use two 20-pin receptacles to receive modules. Figure 4.7.2 XBee-PRO Module Mounting to an RS-232 Interface Board.

VI.SENSORS

PIR SENSOR: Passive Infrareds sensors (IRs) are electronic devices which are used in some security alarm systems to detect motion of an infrared emitting source, usually a human body. The pyro electric sensor is made of a crystalline material that generates a surface electric charge when exposed to heat in the form of infrared radiation.
When the amount of radiation striking the crystal changes, the amount of charge also changes and can then be measured with a sensitive FET device built into the sensor.
This radiation (energy) is invisible to the human eye but can be detected by electronic devices designed for such a purpose.
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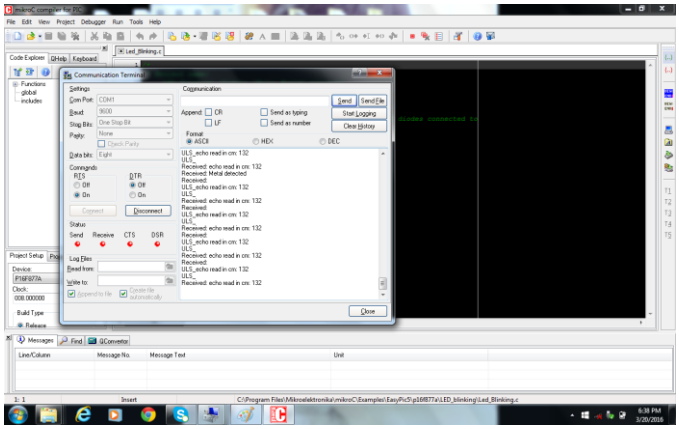

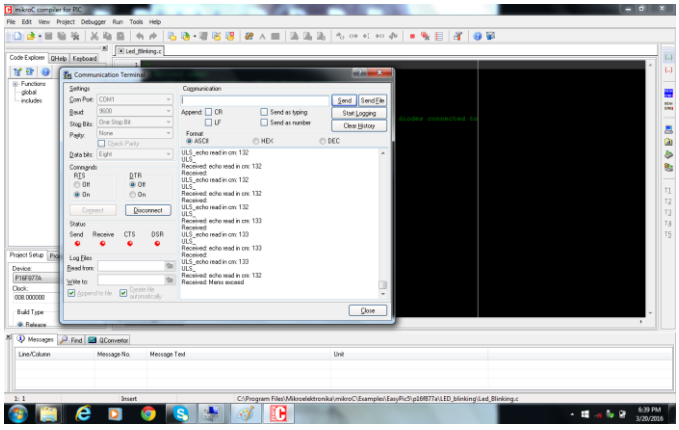

VI. METAL DETECTOR

A Metal Detector is a device which is used to detect a metal object that is not visible to our naked eye. It consists of an oscillator which produces an alternating current that passes through coil producing alternating magnetic field. The first industrial metal detectors were developed in 1960s widely used for mining and other industrial purposes.

VIII.ZIGBEE

The technology defined by the ZigBee specification is intended to be simpler and less expensive than other wireless personal area networks (WPANs), such as Bluetooth or Wi-Fi. Applications include wireless light switches, electrical meters with in-home-displays, traffic management systems, and other consumer and industrial equipment that requires short-range low-rate wireless data

IX.CONCLUSION

Due to drawback in the existing system, we have proposed face and vein recognition in addition for the following reasons

- Authentication has improved
- Accurate measurement
- Reduced delay

With the help of the face and vein module supported by database and transmitting though zigbee from control section to the monitoring section vice versa.

X.REFERENCE

[1] A. Anjos and S. Marcel, "Counter-measures to photo attacks in face recognition: A public database and a baseline," in *Proc. Int. Joint Conf. Biometrics*, Oct. 2011, pp. 1–7.

[2] Kono M, Ueki H, Umemura S, "A new method for the identification of individuals by using vein pattern matching of a finger", Proceedings of the 5th symposium on pattern measurement, Yamaguchi, Japan, ,pp 9-12, 2000.

[3] D. Yi, Z. Lei, Z. Zhang, and S. Li, "Face anti-spoofing: Multi-spectral approach," in *Handbook of Biometric Anti-Spoofing* (Advances in Computer Vision and Pattern Recognition), S. Marcel, M. S. Nixon, and S. Z. Li, Eds. London, U.K.: Springer-Verlag, 2014, pp. 83–102.