iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 7 **Issue:** IV **Month of publication:** April 2019

DOI: https://doi.org/10.22214/ijraset.2019.4211

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887
Volume 7 Issue IV, Apr 2019- Available at www.ijraset.com

Wirefree Glove: Gesture Vocalizer for Deaf and Dumb People

Mr. Sushant Singh[1], Mr. Sawan Kumar Sharma[2], Mr. Brijesh Kumar Dubey[3]
[1]*Scholar, Department of Electrical and Electronics Engineering, PSIT, Kanpur, Uttar Pradesh*
[2, 3]*Assistant Professor, Department of Electrical and Electronics Engineering, PSIT, Kanpur, Uttar Pradesh*

Abstract: ***Gesture based communication is an ordinary route for correspondence among typical and imbecilic individuals, however frequently they discover trouble in speaking with ordinary individuals as we don't comprehend their communication via gestures. In this way, there dependably exists a language hindrance. To limit these boundary, we proposed a gadget which can change over their hand signals into voice which a typical individual can without much of a stretch get it. This gadget comprises of a Wireless Glove which comprise of flex sensors and accelerometer. These sensors sense the development of the hands and fingers. This framework comprises of a speech synthesizer circuit that changes the movement of hand into a real time speech and a showcase will give the content for the comparing signal. The content and voice yield being in English. Along these lines, these gadget give us proficient method for correspondence for both hard of hearing and typical individuals.***
Keywords: Wireless Glove; Flex Sensor; Accelerometer

I. INTRODUCTION

In the ongoing years, there has been a quick increment in the quantity of hearing impedances and discourse handicapped exploited people because of birth absconds, oral ailments and mishaps. At the point when a discourse hindered individual converses with a typical individual, the ordinary individual think that its hard to comprehend and asks the hard of hearing imbecilic individual to indicate signals for his/her needs. Stupid individuals have their very own language to speak with us; the main thing that we have to comprehend their language Sign language is utilized by hard of hearing and quiet individuals and it is a correspondence expertise that are utilizes for signals rather than sound to pass on importance all the while consolidating arms shapes, introductions and development of the hands, arms or body and outward appearance to articulation smoothly a speaker's musings. Be that as it may, more often than not The general population who can not talk or lose their capacity to talk in some mishap, it winds up troublesome for them to express their message. To defeat these issue, we have concocted an answer called 'Savvy GLOVE'. In this venture, Flex Sensor assume the critical job. The glove is fitted with flex sensors and the thumb. The flex sensors give yield as voltage variety that differ with level of twist. This flex sensor has been given the ADC channels of microcontroller. It forms the signs and performs simple to advanced flag transformation. The prepared information is sent in a remote manner to the recipient area. In this part the motion is perceived and the relating yield is shown on the LCD and at the same time a discourse yield is played back through speaker. The uniqueness of this venture is a noteworthy favorable position. Subsequently with the assistance of this undertaking, the deterrents looked by these individuals can be diminished all things considered.

II. RELATED WORK

The communication via gestures identification and acknowledgment frameworks are fundamentally of two after approachs. vision based and picture handling techniques [6] or sensors and microcontroller based glove [1-5]. In the picture handling strategy, the cameras are utilized to catch the motions. These signals are caught as far as pictures and these pictures are examined utilizing an extraordinary motion significance to perceive diverse calculations. One such strategy is examined beneath [6], where an ideal hand signal grouping is made by energizing the comparing key motion outlines with the assistance of separated data. The impediment of picture preparing based procedure is that it requires creating computational calculations so as to distinguish the signals. Further this method likewise requires appropriate lighting conditions, and the field of view restrictions.

III. METHODOLOGY

A. Block Diagram of System

1) The Proposed System Consists Of Primarily Two Sections

*a)*Transmitter section

*b)*Receiver section

©IJRASET: All Rights are Reserved

2) The Blocks Included In The Transmission Section are

a) Flex sensors
b) Accelerometer
c) Avr microcontroller
d) Rf transmitter

3) The Blocks Contained In The Receiver Section Are

a) RF Receiver
b) AVR Microcontroleer
c) Voice Module
d) 16X2 LCD Module

B. Description of the Proposed System

In this framework the transmitter side we utilizes a glove which must be worned by the client. This glove is mounted with 4 flex sensors on every one of the 4 fingers of the glove specifically thumb, record, center, ring. The flex sensors gives the yield as changes in the opposition as per the curve point. The yield from the Flex sensors were given to the ADC channels of the microcontroller. The handled ADC values from the microcontroller are considered for a specific signal. The particular motion is recognized and has given the microcontroller which transmits them through the RF module in a sequential way. For each esteem got at RF beneficiary, the microcontroller gives comparing directions to the LCD and the Voice Module. Subsequently we get the voice yield for each motion and show of each signal in type of content on the LCD show.

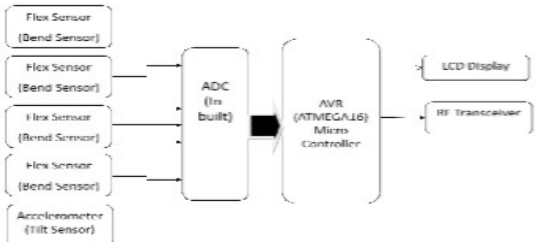


Fig1. Block Diagram of Transmitter Section

A. AVR (ATMEGA328) Microcontroller

The ATmega318 is the less-control CMOS of 8-bit microcontroller dependent on the AVR improved RISC design. The ATmega328 gives the accompanying highlights: 16 Kbytes In-System Programmable Flash Program memory by Read-While-Write capacities, 512 bytes EEPROM, 1 Kbyte SRAM, 32 broadly useful I/O lines, there are 32 general purposes working registers, a JTAG interface For Boundary check, in chip Debugging backing and programming, Three adaptable Timer/Counters with think about modes among Internal and External Interruption of every sequential program USART, one byte arranged of the two-wire as the sequential interface, 8-channel, 10-bit ADC with an Optional differential info organize with a programmable increase (TQFP bundle just), a programmable guard dog clock with the Internal Oscillator, a SPI sequential port, and the six programming selectable power sparing modes. The Idle mode to stops the CPU while permitting the USART, is two wire interface, A/D Converter, SRAM, Timer/Counters, SPI port, and interfere with framework to keep working. The Power-Down Methods of the register spares the substance yet in addition solidifies the Oscillator, and debilitate all other chip works in Power-spare mode, the Asynchronous clock keeps on running, enabling the client to keep up a clock base. The ADC Noise Reduce process stop the CPU and all I/O modules aside from the nonconcurrent clock and ADC, to limit exchanging clamor amid ADC changes. In backup mode, the gem/resonator is running This permit too quick start-up In Extended Standby mode, both the fundamental Oscillator and the Asynchronous Timer keep on running. Henceforth we have to utilize AVR (ATMEGA328) microcontroller with respect to of 8051 miniaturized scale controller.

B. Flex Sensor (Bend Sensor)

In this model the hand motions is perceived by utilizing flex sensor. These sensors are connected to the gloves. Flex sensors are like potentiometer, for example variable resistor The opposition of the sensor fluctuates as indicated by the measure of its bowing, which depends on the development of the finger. So as to fix the twisting flex sensor The flex sensors have a normal level obstruction about 10k ohms. At the point when the sensor is twist opposition offered by it increments.

©IJRASET: All Rights are Reserved

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887
Volume 7 Issue IV, Apr 2019- Available at www.ijraset.com

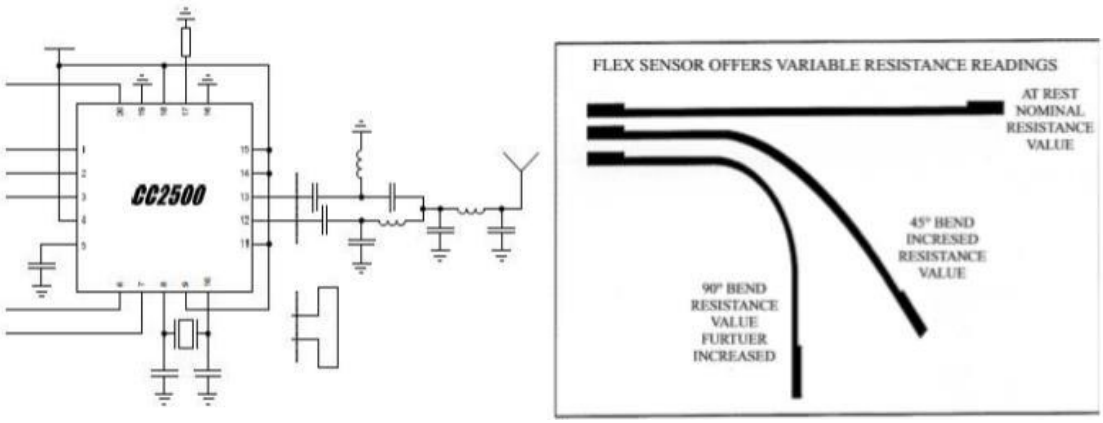


Fig2. Flex sensor

C. Accelerometer (Tilt Sensor)

The ADXL335 is a little, slim and low power gadget equipped for estimating full 3-hub quickening. The ADXL335 can quantify increasing speed with a base full scale scope of ± 3g It requires less power and gives yield motion as far as simple voltages that are corresponding to quickening. It can likewise quantify the static increasing speed of gravity in tilt-detecting applications, just as the dynamic quickening coming about because of movement, stun or vibration. The three tomahawks' sense headings are exceedingly symmetrical and have minimal cross-pivot affectability since it utilizes a solitary polysilicon surface miniaturized scale machined sensor structure for detecting X, Y and Z tomahawks. The client chooses the data transmission of the accelerometer utilizing the Cx, Cy, and Cz capacitors at the X out, Y out, and Z out pins. Data transfer capacities can be chosen to suit the application, with a scope of 0.5 Hz to 1600 Hz for the X and Y tomahawks, and a scope of 0.5 Hz to 550 Hz for the Z pivot. The ADXL335 is accessible in a little size, low cost, 4mm × 4mm × 1.45mm, 16-lead, plastic lead outline chip scale bundle.

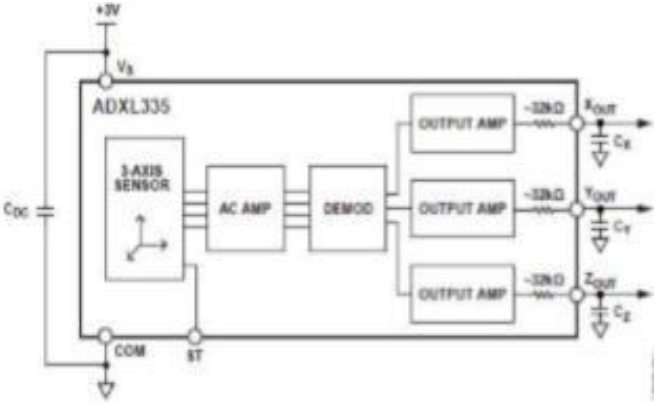


Fig3.Functional Block Diagram

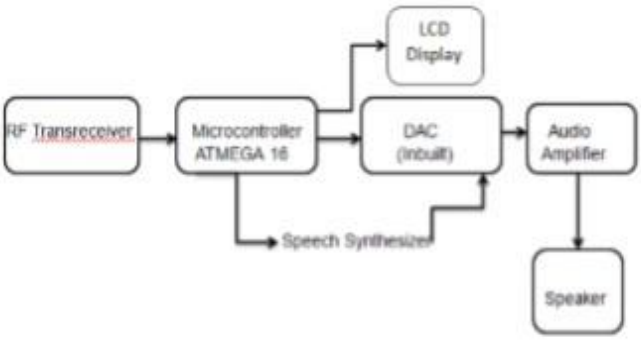


Fig4. Block Diagram of Receiver Side

©IJRASET: All Rights are Reserved

D. RF Transreceiver (CC2500)

The CC2500 is the ease 2.4 GHz handset intended for extremely low-control remote applications gadgets. These circuit is expected structure the 2400-2483.5 MHz ISM (Industrial, Scientific and Medical) and SRD (Short Range Device) recurrence data transfer capacity. With the combination of exceedingly configurable baseband moderm, the RF handset bolsters different balance organizes and have a configurable information rate as much as 500 kilo Band. It gives 30, meter go with on board reception apparatus. In an ordinary framework, this trans-collector will be utilized with a microcontroller. It gives us the wide equipment support for the bundle dealing with, information buffering, burst transmissions, clear channel appraisal, connect quality sign and wake on radio. (e.g., RKE - twoway Remote Keyless Entry, remote caution and security frameworks, AMR-Automatic Meter Reading and Control, Wireless Game Controllers, Wireless Audio/Keyboard/Mouse). It could without much of a stretch be utilized It can be utilized on remote security framework or explicit remote-control work and different remote frameworks.



Fig5.RF Transceiver Module
Fig6. RF Transceiver

E. Voice OTP IC (aP8942A)

A P8942A is the high performance Voice OTP that is fabricated with Standard CMOS process with embedded 1M bits EPROM. It can store up to 42sec voice message with 4-bit ADPCM compression at 6KHz sampling rate. There are two trigger methods, simple key trigger method and other is the parallel CPU User selectable triggering method, the output signal options provide maximum flexibility to various applications. Built-in resistor controlled oscillator, 8bit current mode D / A output and PWM direct speaker When the user does get "Understand" as shown in

Fig.7, the values from sensors are sent through micro controller through ADC ports. The microcontroller receives these values and converts them in digital form and simultaneously displayed on LCD. driving output. With the help PC controlled program and developing software, we can program this IC as per our needs .

IV. RESULT

In our framework, the individual who wears the glove ought to be around 2 seconds so as to distinguish the specific motion. Each motion comprises of development and twisting of the fingers of a specific request with explicit point correspondingly. The sensor esteems that are being produced by the Flex sensors and an accelerometer are sustained to the ADC channel of the microcontroller. For each twisting of Flex sensors and development of an accelerometer, these sensors produce diverse points. The diverse motions are appointed one of a kind numbers. When a signal is coordinated, it is being shown on LCD and the equivalent is transmitted by means of Wireless Transceiver. Applying a correlation strategy on the recipient side of the framework, for each esteem that has been gotten, the microcontroller yields motion explicit directions to the LCD module at the collector and to the Voice IC at the same time for the discourse flag and content in like manner.

Gesture	Understand	Smile	Come on let's go	Thank You
Index	<410	<410	<400	<400
Middle	<410	<410	<400	<400
Ring	>500	>500	<400	>500
Thumb	<460	>500	<460	>500
X-axis	>600	>500	>600	>500
Y-axis	>600	>600	>500	>600
Z-axis	>500	>500	>400	>500

Table1: ADC Values for each sensor

When the user does get "Understand" as shown in Fig.7, the values from sensors are sent through microcontroller through ADC ports. The microcontroller receives these values and converts them in digital form and simultaneously displayed on LCD.

©IJRASET: All Rights are Reserved

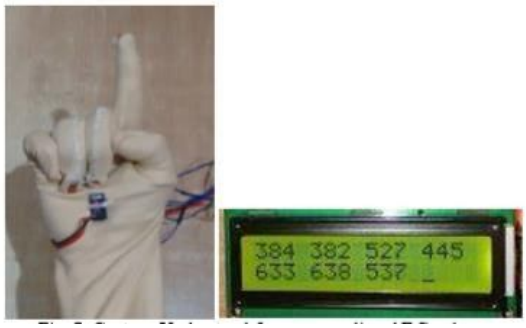


Fig.7 Gesture-Understand & corresponding ADC values

V. CONCLUSION

This framework is helpful for imbecilic, hard of hearing and visually impaired individual to speak with each other. The dumb individuals utilize their standard communication through signing which isn't effectively reasonable by everyday citizens and visually impaired individuals can't see their signals. This framework changes over the gesture based communication into voice design which can be effectively reasonable by the visually impaired and the typical individuals. These gesture based communication is likewise converted into some content structure, to encourage the hard of hearing individuals also. This content is show on LCD so as to improve and encourage the more motion acknowledgment, movement handling unit can be introduced which incorporates the Gyroscope also and the assistance sensor combination method, we can suit various different motions just as better and proficient correspondence.

REFERENCES

[1] ATA-UR-Rehman, Salman Afghani, Muhammad Akmal, Raheel Yousaf, "Microcontroller and Sensors On Gesture based Vocalizer", Proceedings of the 7th WSEAS International Conference on Signal Processing, Robotics and Automation (ISPRA '08) ISSN: 1790-5117 8 2 ISBN: 978-9606766-44-2, University of Cambridge, UK, February 20-22, 2008.

[2] Vikram Sharma M, Vinay Kumar N and DR Ambika, "Virtul Talk for Deaf, Mute, Blind and Normal Humans" , 2013 Texas Instruments India Educators' Conference, 978-0-7695-5146-3 / 13 $ 26.00 © 2013 IEEE DOI 10.1109 / TIIEC.2013.63A

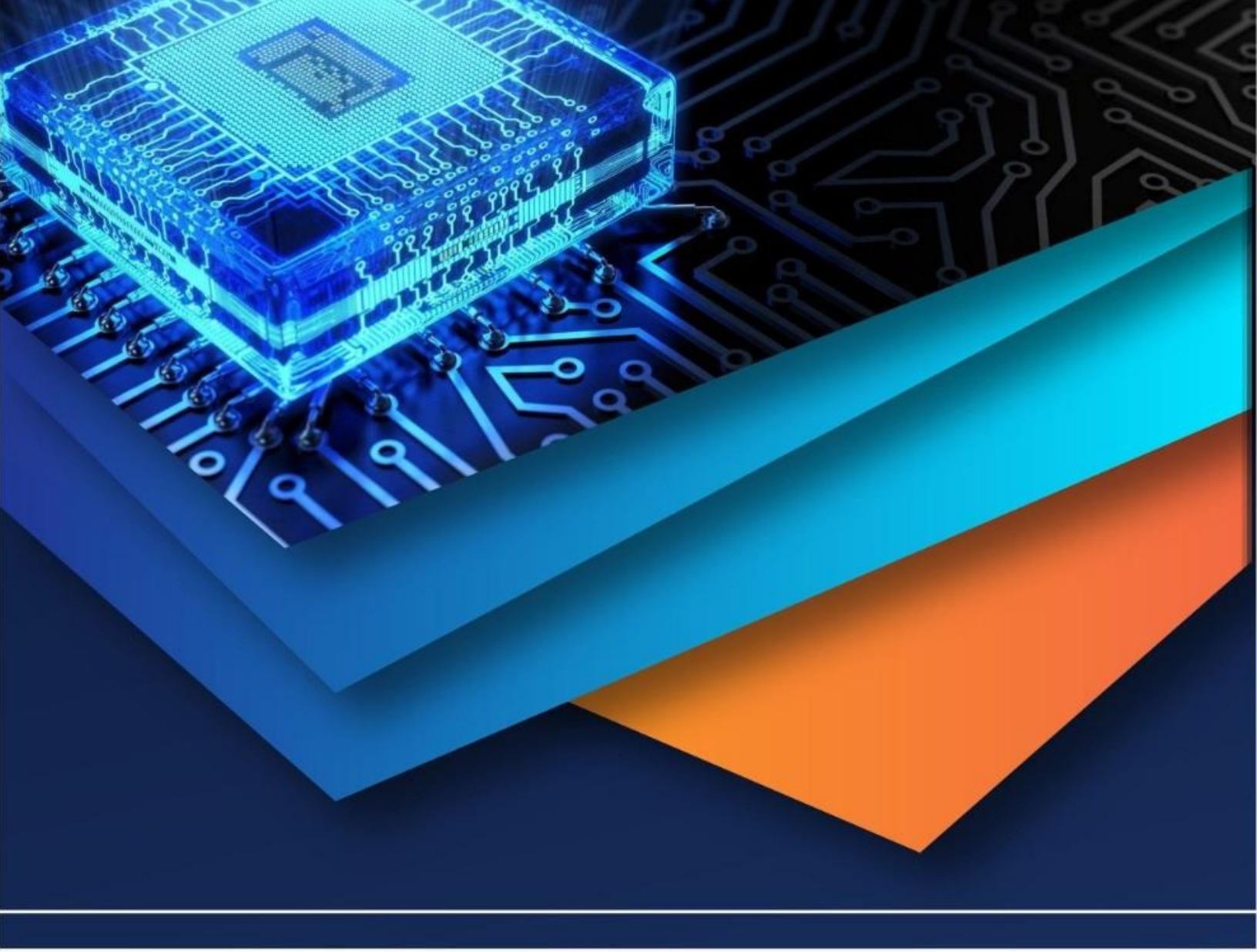
[3] Mrs.Neela Harish and Dr.S.Poonguzhali, "Design and development of hand International Conference on Industrial Instrumentation and Control (ICIC) College of Engineering Pune, India, 978-1-4799-7165-7 / 15 / $ 31.00 © 2015 IEEE, May 28-30, 2015

[4] Nikhita Praveen, Naveen Karanthand Megha MS, "Sign Language Interpreter Using A wireless Glove", 2014 International Conference on Advances in Electronics, Computers and Communication (ICAECC). 978-1-4799-5496-1 / 14 / $ 31.00 © 2014 IEEE

[5] Rohit Rastogi, Shashank Mittal and Sajan Agarwal, "A Novel Approach for Communication among Blind, Deaf and Dumb People", 2015 2nd International Conference on Computing for Sustainable Global Development (INDIA Com), 978-9-3805-4416-8 / 15 / $ 31.00 © 2015 IEEE

[6] MK Bhuyan Chaitanya and Darsha Sharath Chandra, "finger movement Animation by Key Frame Extraction", 2011 International Conference on Image Information Processing (ICIIP 2011), 978-1-61284-861-7 / 11 / $ 26.00 © 2011-IEEE

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)