

**CATALOGUE OF B.E. PROJECT REPORTS  
BATCH 2009 - 2013**

**BRANCH - ExTC**

**ABSTRACTS**

**LIBRARY AND INFORMATION RESOURCE CENTRE  
ST. FRANCIS INSTITUTE OF TECHNOLOGY (ENGG. COLLEGE)  
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## Introduction

The Library and Information Resource Centre team is happy to bring out this catalogue listing B. E. Project Reports submitted by the 2009-2013 batch students to the Institute. This document covers abstracts of 27 projects submitted by 2009-13 batch students and are listed in alphabetical order under each year by the project title. Each entry of the project provides the bibliographical details, such as authors , title, page numbers, year of submission, supervisor name, keywords (wherever applicable) and abstracts. Accession Numbers have been provided to enable the user to locate a specific entry in this catalogue.

Hope you will find this document useful. We would be happy to have your comments and suggestions, if any, to improve this catalogue further.

Updated on: 27/03/2014

Library and Information Resource Centre Team

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## Branch = EXTC (2013)

**Title:** Anthropomorphic Robotic Arm

**Author:** Karan Kachroo (19)  
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Ashish Sharma (43)  
Vivian Noronha (62)

**Project Guide:** Prof. Vaqar Ansari

**Keywords:**

**Abstract:** The report focuses on the design and demonstration of an anthropomorphic robotic arm with seven degrees of freedom using readily available low-cost components to perform different real time human hand applications. The robotic arm consists of a shoulder, elbow, wrist and a five-finger gripper. It can perform different gripping actions, such as lateral, spherical, cylindrical and tip-holding gripping actions using a five-finger gripper; each finger has three movable links. The actuator used for the robotic arm is a high torque dc servo motor coupled with a gear assembly for torque amplification, and the five-finger gripper consists of five cables placed like tendons in the human arm. . Implementation is done using a human hand glove which senses the motion from sensor technology to produce a proportional analog voltage, digitized via the microcontroller Atmel AT mega32. The microcontroller then through the processed signal controls the mechanical structure that is the robotic arm.

**Acc. No. PR 810 / EXTC 215**

**Title:** Image Quality Assessment

**Author:** Steave D'souza (12)  
Renia Lopes (24)  
Sonia Lopes (25)  
Virginia Menezes (29)

**Project Guide:** Prof. Savita Kulkarni

**Keywords:**

**Abstract:** Image Quality Assessment has emerged as an important research area in the recent past. Among the many well-known full-reference objective evaluation algorithms, most of them are adapted for a set of degradations but inefficient for others and most are suitable to evaluate the quality of grayscale images only. This report focuses on a full-reference objective color image quality measure that overcomes the major limitation of existing algorithms. The quality measure is designed as a combination of luminance similarity, structure correlation, edge similarity and color similarity. This new objective color assessment technique has been evaluated for various image Distortions and its performance compared with the performance of other existing techniques.

**Acc. No. PR 811 / EXTC 216**

**Title:** Dual Band Monopole Antenna Design

**Author:** Jithu Paul Jacob (Roll No 16)  
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**Project Guide:** Prof. (Dr.) Uday Pandit Khot

**Keywords:**

**Abstract:** The WLAN and Bluetooth applications become popular in mobile devices, integrating GSM and ISM bands operation in one compact antenna, can reduce the size of mobile devices. Recently, lot many investigations

are carried out in designing a dual band antennas with operating frequencies around 900 MHz GSM band and 2.4 GHz ISM band for mobile devices. Printed monopoles are under this investigation. In this report, dual-band printed monopoles are presented to operate at GSM band i.e. 900 MHz and ISM band i.e. 2400 MHz. We intend to observe the antenna characteristics on the network analyzer and verify the theoretical results with the practical ones.

**Acc. No. PR 812 / EXTC 217**

**Title:** Modified DES based on Elliptic Curve

**Author:** Mona Pereira (36)  
Shinu Roy (42)  
Sharon Aranha (46)  
Noel Fernandes (51)

**Project Guide:** Prof. Kavita A. Sakhardande

**Keywords:**

**Abstract:** Security of data is pivotal in modern day computer systems. Wired and wireless communications as also in applications where access control, data integrity, confidentiality, and authentication are required have security of data as the prime concern. This can be achieved with a combination of hardware and software. The best features of both hardware and software are combined resulting in an improvement in security as also speed. The Data Encryption Standard (DES) is a block cipher that has been used for many years. However DES has a few drawbacks and was thus superseded by the Advanced Encryption Standard (AES). The Project "Modified DES based on Elliptic Curve" aims at designing a hardware system to implement a modified version of DES based on Elliptic Curve (EC) Algorithm. Elliptic curve cryptography is an approach to public-key cryptography based on the algebraic structure of elliptic curves over finite fields. In this modified DES, Feistel function and S-box method is used like in DES, but based on EC. A comparison between hardware implementation of the regular DES, the AES and the modified DES based on microcontroller will be carried out. A comparison will be conducted for these three algorithms on parameters such as the key size, block size, execution time and speed.

**Acc. No. PR 810 / EXTC 215**

**Title:** Self Re-Configurable TCP Vegas

**Author:** Swapnil Bunde (Roll No. 02)  
Ashish Dhumal (Roll No. 07)  
Priyesh Kanani (Roll No. 20)  
Adhish Rane (Roll No. 39)

**Project Guide:** Prof. Jayasudha Koti

**Keywords:**

**Abstract:** Transmission Control Protocol (TCP) Vegas detects network congestion in the early stage and successfully prevents periodic packet loss that usually occurs in TCP Reno. It has been demonstrated that TCP Vegas outperforms TCP Reno in many aspects. However, TCP Vegas suffers several problems that affect its congestion avoidance mechanism. One of the most important weaknesses in TCP Vegas is that the lower bound and upper bound of the desired queue length depends on a good expected throughput as well as on a good minimum Round Trip Time estimate. In order to make the system more robust, lower bound and upper bound must be made responsive to network conditions (lower bound and upper bound are currently chosen statically). This project gives a modified Vegas algorithm, which can be adjusted to present good performance compared to other Transmission Control Protocols techniques. In order to do this, we use the Particle Swarm Optimization (PSO) algorithm to tune lower bound and upper bound. The simulation results will validate the advantages of the proposed algorithm in term of performance.

**Acc. No. PR 814 / EXTC 219**

**Title:** Hardware Implementation of JPEG2000 Encoder

**Author:** Kiran Hardas (15)  
Pravin Jha (56)  
Harish Menon (60)  
Nikhil Prabhu (65)

**Project Guide:** Prof. T.S. Rathore

**Keywords:**

**Abstract:** The new still image compression standard, JPEG2000, has emerged with a number of significant features that would allow it to be used efficiently over a wide variety of images. The project is to design and

implement JPEG2000 Encoder using Very High Speed Integrated Circuit Hardware Description Language (VHDL) in FPGA. It is divided in two stages: (i) writing the Simulink/VHDL code and its simulation and (ii) implementing the same in hardware by using an FPGA kit. It uses software that consists of pre-processing, DWT, quantization and entropy coding blocks. DWT implementation is based on the lifting scheme, which is computationally most efficient implementation of the discrete wavelet transform, and on a line based reduced memory scheme. The hardware module exhibits lower memory consumption than the existing software.

**Acc. No. PR 815 / EXTC 220**

**Title:** Self Monitoring Intelligent Elevator

**Author:** Riddhish Desai (06)  
Abishai Dmello (09)  
Smitha Kannanaikkal Thomas (21)  
Alan Thomas (44)

**Project Guide:** Dr. Gautam Shah

**Keywords:**

**Abstract:** Self Monitoring Intelligent Elevator aims to bridge the gap between expensive multiple elevator systems and single elevator systems which do not live up to their expected performance especially in cases of overcrowding in the cabin. It utilizes a microcontroller that monitors certain parameters given by various sensors interfaced to it, so as to avoid unnecessary movement between floors. This will help the elevator system to minimize the amount of energy which would be used unnecessarily, to operate the motor under a tensed cable. Thus making it an efficient elevator system that establishes a right amount of balance between cost, user efficiency and an increased life span.

**Acc. No. PR 816 / EXTC 221**

**Title:** Reconstruction of Underwater Image by Bispectrum

**Author:** Neil Crasto (Roll No. 04)  
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Dolfrie Martin (Roll No. 27)  
Calvin Fernando (Roll No. 52)

**Project Guide:** Prof. Vaqar Ansari

**Keywords:**

**Abstract:** An object which is placed under water and observed from above its surface appears to be blurred and distorted because of a virtual image been produced in the retina of the human eye caused by change in refractive index of medium through which the light travels. This phenomenon is termed as refraction. Reconstruction of the underwater image affected by refraction is a challenging task. Researchers from different areas have addressed this problem. Some focused on reconstructing the surface of the water, some tried statistical theory to recover the target and some applied image processing techniques. This challenge can be overcome by taking a sequence of images and making use of the third order statistics called bispectrum. Bispectrum is used to compute and recover the phase information of the object of interest and it nullifies the phase produced or contributed by water. The angle of refraction causing distortion in the image is thus eliminated and the true real optimum image can be retrieved. This technique has wide applications in areas such as ocean study and submarine observation.

**Acc. No. PR 817 / EXTC 222**

**Title:** Emotion Recognition for Spoken Words

**Author:** Salina Dbritto (05)  
Brionie Rodrigues (41)  
Raj Hindocha (54)  
Dipesh Prajapati (67)

**Project Guide:** Prof. Santosh Chapaneri

**Keywords:**

**Abstract:** Emotion Recognition from speech has emerged as an important research area in the recent past. Emotion recognition helps to recognize the internal expression of the individuals from speech database. For a reliable and high accuracy of emotion recognition, simple and efficient representation methods are required. For our project, we have used MFCC to calculate the features of the input speech signal and Dynamic Time Warping (DTW) algorithm has been implemented for feature recognition. To increase the computation speed we have used enhanced techniques like SOLAFS and efficient MFCC resulting in an accuracy of over 72%. Our project demonstrates emotion recognition for 5 emotions happy, sad, anger, surprise and neutral over a database

containing large variety of speakers.

### Acc. No. PR 818 / EXTC 223

**Title:** Depth Estimation from Monocular Images

**Author:** Aditya Venkatraman (Roll No 3)  
Hemang Raichura (Roll No 14)  
Nikhil Mahishi (Roll No 22)

**Project Guide:** Prof. Sheetal Mahadik

**Keywords:**

**Abstract:** Depth estimation or extraction refers to the set of techniques and algorithms aiming to obtain a representation of the spatial structure of a scene. In other terms, to obtain a measure of the distance of, ideally, each point of the seen scene. A depth estimation algorithm is hence built to empower the computer with depth perception, using monocular cues. A global optimization approach is used to realize absolute and relative depth of points, and supervised learning is applied to predict the depth map as a function of the image.

### Acc. No. PR 819 / EXTC 224

**Title:** H.264 Video Error Concealment

**Author:** Sannidhi Dixit (08)  
Elveera Menezes (28)  
Saurabh Mistry (31)  
Cavin D'souza (50)

**Project Guide:** Prof. Santosh Chapaneri

**Keywords:**

**Abstract:** The visual distortions that occur while viewing a video sequence that is transmitted over an error prone channel is a necessary motivation for the research in the field of video error concealment. The spatial as well as temporal correlations are exploited in order to achieve a refined error concealment scheme. The methods used in the Joint Model (JM) Reference software and few other methods suggested by various authors have been explained briefly and implemented with appropriate experimental results. On implementing the error concealment scheme at the post decoder end the electronic application consumer can view a better quality video irrespective of the packet losses taking place over the error prone network. The spatial concealment uses the concept of spatial correlation within the frame whereas temporal error concealment carries out concealment taking into account the correlation from the previous and/or the future frames. The quality metrics that we have used for our analysis are PSNR and MSSIM.

### Acc. No. PR 820 / EXTC 225

**Title:** Improved Motion Estimation for H.264 Video Compression

**Author:** Fremin Kannampuzha (53)  
Dharmendra Jha (55)  
Justin Joseph (58)  
Stewew Possa (64)

**Project Guide:** Dr. Deepak J. Jayaswal

**Keywords:**

**Abstract:** The H.264 video compression standard supports the most efficient video compression techniques available today. H.264 encoder can reduce the size of a digital video file by more than 80% compared with the Motion JPEG format and as much as 50% more than with the MPEG-4 Part 2 standard, thus ensuring less network bandwidth and storage space. H.264 supports video compression using motion estimation scheme. Many block matching algorithms (BMA) have been developed to achieve motion estimation, and to meet the requirement of better compression quality and less computational time. Full Search (FS) is an optimal search algorithm for motion estimation, but it suffers from high computational time. Motivated by the need for fast and accurate motion estimation, we intend to implement an improved motion estimation algorithm, which has better PSNR value with fewer number of search points. We have considered a fast adaptive motion estimation (FAME) algorithm, which utilises correlation between neighbouring macroblocks in temporal and spatial domain, and adaptive thresholding to accelerate the process of motion estimation. Also, a probability based search motion estimation (PBSMC) algorithm which uses the concept of mean correction to improve PSNR is considered. The PBSMC algorithm dynamically shrinks or enlarges its search pattern to account for small and large motion, thus improving upon the suboptimal and optimal search algorithms.

**Acc. No. PR 821 / EXTC 226****Title:** Speech Enhancement**Author:** Sanchiana Carvalho (48)  
Akshata Nayak (61)  
Jaina Prajapati (66)  
Denita Varikkasery (70)**Project Guide:** Prof. Deepak Jayaswal**Keywords:**

**Abstract:** This project aims to implement and compare a number of techniques for enhancement of speech that has been degraded by noise. Such degradation could take place, for example, in mobile environments where the user is in a public place, or in the case of a hands-free situation in a car. Despite the inherent robustness of the human auditory system, the addition of high levels noise can result in a significant reduction of intelligibility of the degraded speech; therefore, enhancement through noise reduction is often a critical part of speech communication system. The project examined a number of speech enhancement techniques, including in particular the commonly used Spectral Subtraction, Wiener filtering and Adaptive filtering.

**Acc. No. PR 822 / EXTC 227****Title:** Implementation of Channel Coding in OFDM system**Author:** Sherin Gilson (14)  
Navin Noronha (32)  
Norita D'souza (49)  
Mildred Pereira (63)**Project Guide:** Prof. Jayasudha Koti**Keywords:**

**Abstract:** Orthogonal frequency division multiplexing (OFDM) is a special case of multicarrier transmission, where a single data stream is transmitted over a number of lower rate subcarrier. Channel Coding plays a very important role in OFDM systems performance. This project shows the comparative study for the three different channel coding techniques. Plotting of the BER v/s SNR plot and analysis of OFDM system with channel coding to obtain practical results shows the effectiveness of OFDM and its robustness against frequency selective fading in noisy environments. The simulation blocks include the proposed OFDM system to minimize errors in Wireless communication systems using channel coding.

**Acc. No. PR 823 / EXTC 228****Title:** Fractal Image Compression**Author:** Anisha Carneiro (03)  
Clifford D'Souza (11)  
Nishika Prabhu (38)**Project Guide:** Prof. Kavita Sakhardande**Keywords:**

**Abstract:** Image compression is an essential technology in multimedia and digital communication fields. Most of the existing image coding algorithm is based on the correlation between adjacent pixels. Fractal image compression is a new technique for encoding image compactly. It builds on local self-similarities within images. It has a character of high compression-ratio and can zoom in or out at will without losing any detail. But it has a disadvantage of lengthy compression time unfit for real process and practical applications. We have implemented two methods: Fractal Image Compression using the traditional full search method and discrete cosine transform based method, and have also compared both these methods.

**Acc. No. PR 824 / EXTC 229****Title:** Wireless Laser Communication System**Author:** Austin John (18)  
Nachiket Ayir (47)  
Flynn Jiu (57)  
Rohit Tiwari (69)



**Project Guide:** Dr. Deepak Jayaswal

**Keywords:**

**Abstract:** Wireless laser communication is rapidly getting popularity as an effective means of transferring data at high rates at long ranges. The system includes a laser transmitter and a receiver along with control and driving electronics separated by a distance. Laser beam propagating through atmosphere carries the information from transmitter to the receiver. The system provides many advantages such as rapidly deployable large bandwidth, secure communication link for jam resistant, light weight and compact equipments. The advantages have attracted the users in civil and defence sector. The data rate demands have also risen from hundreds of Mbps to tens of Gbps. Whether in theory or practical application, it is very important to study and develop wireless laser communication techniques. There has been a lot of research of such laser communications for different kinds of applications. In the circumstances we develop an experimental wireless laser digital communication system employing optical Pulse Interval Modulation (PIM) for transmitting digital signals and an analog communication system employing Intensity Modulation (IM) for transmitting audio signals.

**Acc. No. PR 825 / EXTC 230**

**Title:** Security of Embedded Systems using Advanced Encryption Standard

**Author:** Hansel Fernandes (13)  
Jacqueline Johnson (17)  
Pranav Kini (22)  
Swidle Remedios (40)

**Project Guide:** Prof. (Dr.) Uday Pandit Khot

**Keywords:**

**Abstract:** Security is an important aspect of embedded system design. The characteristics of embedded systems give rise to a number of vulnerabilities. A variety of different solutions are being developed to address these security problems. The Advanced Encryption Standard (AES) algorithm has become the default choice for various security services in numerous applications. AES algorithm can be implemented in software as well as hardware. However, Field Programmable Gate Arrays (FPGAs) offer a quicker, more customizable solution. This project implements the AES algorithm on FPGA using Very High Speed Integrated Circuit Hardware Description language (VHDL).

**Acc. No. PR 826 / EXTC 231**

**Title:** Face Recognition using Optimization Techniques

**Author:** Ankur Bali (01)  
Rakesh Machigar (26)  
Arun Kumar Pandey (33)  
Jay Patel (34)

**Project Guide:** Dr T S Rathore

**Keywords:**

**Abstract:** Feature selection is an important step in face recognition, which reduces the number of features, removes irrelevant, noisy and redundant data and results in acceptable recognition accuracy. This project aims to implement feature selection algorithm using optimization techniques, namely Ant Colony Optimization (ACO) and Particle Swarm Optimization (PSO). The algorithms are applied to the co-efficient obtained from feature extraction. Finally a comparison is made between the ACO and PSO techniques for recognition accuracy.

**Acc. No. PR 827 / EXTC 232**

**Title:** Dual Tone Multi Frequency (DTMF) Controlling Devices

**Author:** Nishith P Mishra (74)  
Amey J Gangnaik (76)  
Naitik C Bhatt (77)  
Jinal R Patel (78)

**Project Guide:** Dr T S Rathore

**Keywords:**

**Abstract:** This project is based on the Dual-Tone Multi Frequency (DTMF) Controlled Device. It provides complete security using Third Generation (3G) mobile camera. This is a new type remote control by using Radio Frequency (RF) communication technology, which is a portable electronic device. In this project a remote has been

designed for various home appliances like television, fan, lights, etc. One can control any of the appliances by using this remote. DTMF encoder sends the information in the form of frequency from 3G hand-set. At the receiving section RF unit is present, which has high sensitivity and with this it senses the transmitted rays by the RF transmitter. Whenever any key is pressed in the remote it generates the corresponding RF rays, and these rays are received by the IR receiver unit.

**Acc. No. PR 828 / EXTC 233**

**Title:** GESTURE CONTROLLED WHEELED ROBOT

**Author:** Shilpa Jain (71)  
Tejas Shah (72)  
Prashant Tripathi (73)  
Saurabh Trivedi (75)

**Project Guide:** Prof. Vaqar Ansari

**Keywords:**

**Abstract:** Human interaction and interfacing is a field which requires innovation and intuitiveness in modern times thanks to the ever increasing dependence of humans on machines. The objective of this project is to build a wheeled robot that can be controlled by gesture wirelessly. User is able to control motions of the wheeled robot by wearing the controller glove and performing predefined gestures. This project provides a basic platform for many potential applications such as wireless controlled car racing games, gesture human-machine interfacing, and etc. For this project, Arduino, wireless transmitter and gyroscope are employed for the controller; Arduino, motor driver and wireless receiver are employed for the controlled robot. A pair of wireless UART module, XBee, is used to communicate between the controller and tank.

**Acc. No. PR 829 / EXTC 234**