PROJECTS

B.Tech

Computer Science and Engineering

Selecting Best Access Point in a Wireless Network using NS3

This new algorithm uses fuzzy logic to select the best access point in a wifi using Network Simulator. The potential bandwidth is identified as a metric based on which hosts should make affiliation decisions, and it is defined as the (MAC-layer) bandwidth that the client is likely to receive after affiliating with a particular access point. It is implemented using network and gnuplot.

Cued Click Point Graphical Password Authentication

Cued Click Points (CCP) is a form of cued-recall graphical password technique. Users click on one point per image for a sequence of images. The next image displayed is based on the previous click-point, so that users will receive immediate implicit feedback as to whether they are on the correct path when logging in.

Malayalam Optical Character Recognition Software

Optical Character Recognition (OCR) is the automatic conversion of scanned images of machine printed or handwritten documents into computer processable codes. The scanned image of a printed page is converted to a corresponding sequence of Unicodes after pre-processing, segmentation, feature extraction, recognition and training of new fonts for Malayalam OCR stages.

Electronics and Communication Engineering

Image Processing Based Virtual Reality Keyboard and Mouse

The project is an image processing based virtual keyboard and mouse. A projector projects a keyboard layout scanned by an infrared camera connected to the computer. Image processing is used to detect the key press events and the infrared camera tracks their movements. A hardware switch allows the user to switch in between the keyboard and mouse operations.

Automated Public Distribution System

Right from data entry to weighing, delivering and billing, all processes are automated and no manual labour is involved. The system can keep track of all the data including customer information, stock balance information and maintenance. The public can be notified of stock availability providing public satisfaction and trust.

Phased Array Speaker System

An array of antennas in which the relative phases of the respective signals are varied in such a way that the effective radiation pattern is reinforced in a desired direction and suppressed in undesired directions. A Phased Array Speaker System is capable to generate flexible and directional sound.

Electronics and Biomedical Engineering

Air Eye Real Time Remote Intelligent Patient Monitoring System

A project based on monitoring of patients located in remote locations helping the doctor attend to the patient around the globe. It enables the doctors to monitor and send patient's parameters (temperature, heartbeat, ECG) in real time, they are measured continuously and the data could be accessed by doctors located at any part of the world provided he has an internet connection.

Device to Prevent Deep Vein Thrombosis (DVT)

Sluggish blood flow causes deep vein thrombosis which is prevented by sequential compression. This device inflates cuffs placed along the leg one after another in a sequential manner. It can be used by people at risk of DVT, when they are immobile.

Medical Emergency Responder Bike

The project led to the development of a two wheeler ambulance equipped with necessary trauma care devices and other basic entities. The equipments include defibrillator, ECG, heart rate monitor, pulse oximeter, respiratory assisting equipment, video telemetry and other necessary circuits.

Electrical and Electronics Engineering

Magnetically Levitated Vertical-Axis Wind Turbine System

The project implements a magnetically levitated vertical axis wind turbine system that has the ability to operate in both high and low wind speed conditions. It showcases efficiency in varying wind conditions as compared to the traditional horizontal axis wind turbine and use wind energy as the energy source for levitation.

Self starting Generator

This is a back EMF permanent electromagnetic generator and method using a regauging process for capturing the available electromagnetic energy in the system. The flux fields created by the coils is collapsed because of a reversal of the magnetic field in the magnetized poles, thus allowing the capture of available back EMF energy.

DC to DC Changeover Switch

In substation the control panel is delivered with DC supply from battery charger. The project incorporates a DC changeover switch where switching is done between two sources. The project aims to reduce switching time, losses and provide ease in functioning without interruption.

M.Tech

Energy Management

Impact of Modifications on the Process System Value of a Captive Power Plant

The paper presents the impact of the modifications done in De-Super heater and Flame Burner System of a Boiler in its conversion from Oil fired to LNG fired system on the process system value of 7MW Captive power plant of a fertilizer process industry. The paper also examines the criticality of LNG price variation on the modified processes.

Performance Analysis of Monocrystalline Solar Panel

This work presents the results of various performance based experimentations conducted on a monocrystalline solar panel using LED lights of different wavelengths. The paper also proposes suitable wavelengths for the testing purposes of solar panels.

Concentrator Photovoltaic Panel with Water Cooling

Concentrated photovoltaics (CPV) is another alternative to the traditional flat array form. It optimizes a concentrator system. All the features and parameters of the different components are implemented.

Signal Processing

Automatic Traffic Surveillance System Simulation

The vision based approach of the project has advantages of maintenance and high flexibility in traffic monitoring. Vehicles can be detected by image differencing and tracked using Kalman filtering.Once vehicle size is extracted, an optimal classifier is then designed to robustly categorize into different classes.

3-D Object Recognition of Canonical Objects from 2-D Views

3D Object Recognition has two parts - training and recognition. The recognition algorithms are robust and implemented in CUDA GPU since recognitions and training algorithms support parallel processing.

QRS Complex Processing for Telemetry

The compression of ECQ signal is necessary in many transmission and storage applications. Effective storage is required for large quantities of ECG information in ICCU or monitoring tasks. The possible method of QRS compression is by using Transformed Lorentz function.

VLSI and Embedded Systems

Android based Sleep Apnea Monitor

This project analyses ECG signal for the estimation of Sleep Apnea in Android platform. Pan Tompkins algorithm is used for the QRS detection and RR interval estimation. The estimated RR interval is used for extracting different parameters for the detection of Sleep Apnea.

Impact of Modifications on the Process System Value of a Captive Wi-Fi Fingerprinting based Indoor Navigation

The project utilizes Wi-Fi or WLAN networks to determine the accurate position of the user. Generally the drivers are equipped with an android based smartphone with a Wi-Fi module. The Wi-Fi module in a smartphone can access the details about the nearest Wi-Fi access points without having a point to point link between them.

Power Gated Logic for Asynchronous Pipelines

The project presents a novel way of high throughput and ultra-low-power asynchronous domino logic pipeline design method, targeting to latch-free and extremely fine-grain design. The power gated logic proposed combines the energy saving benefits of asynchronous and domino logic to produce systems whose power dissipation can be reduced in several different ways.

Optoelectronics and Communication

EDFA Control Techniques for WDM Link

EDFA (Erbium Doped Fiber Amplifier) transient effects are one of the serious issues in optical communication. The transient effects due to single signals and multiplexed signals are analyzed in this project. Further, a compensation technique is proposed to nullify the transients.

Sensor Module for Computer Vision Based Autonomous Spacecraft Docking System

Spacecraft Rendezvous and Docking (RVD) is one of the complex and accuracy demanding tasks in space missions. A sensor module consisting of three sensors namely, a pattern tracker for long distance ranging, a vision based laser range finder and an optic flow sensor based on computer vision techniques, is proposed in this project.

Performance Analysis of Open and Closed Loop WDM Systems

The objective of this project is to formulate desirable monitoring technology which is cost effective in the PON market. OTDP is a versatile instrument of testing optic fibers during installation, maintenance and restoration.

Image Processing

Retinal Blood Vessel Segmentation

The project aims at automated retinal blood vessel segmentation for diabetic retinopathy screening from among the alternatives available and also finds the width of retinal blood vessels.

A Secure and Quality Preserving Data Hiding Scheme based on Visual Cryptography

It deals with a secret sharing mechanism where an image is encrypted using visual cryptography, and the shares generated are hidden within separate cover images. Security is enhanced using an image based authentication system while the size of images transmitted is kept in check using an efficient image compression method, the Error Diffusion based Block Truncation Coding.

Visibility Enhancement of Dimmed and Hazy Images using Adaptive Gamma Correction

The method addresses three issues, namely, enhancing the visibility of dimmed images by improving the brightness and contrast, reducing the halo effect and removal of unwanted noise signals.

SYLLABUS

Computer Science and Engineering

Core Subjects

1. Object Oriented Programming
2. Computer Networks
3. Data Structures and Algorithms
4. Database Management Systems
5. Computer Architecture
6. Software Architecture
7. Compiler Construction

Electives

1. Security in Computing
2. Embedded Systems
3. Neural Networks
4. Agent Based Intelligent Systems
5. Mobile Computing
6. System Modelling and Simulation
7. Data Mining

Lab facilities

Data Structure Lab, Computer Graphics Lab, System Programming and Hardware Lab, Networks and Operating System Lab.

Electronics and Communication Engineering

Core Subjects

1. ASIC
2. VLSI
3. Embedded Systems
4. Digital Signal Processing
5. Hardware Modelling
6. Mechatronics
7. Optoelectronics & Communication

Electives

1. Optical Fibre Communication
2. Nanoelectronics EMI/EMC
3. Adaptive Signal Processing
4. Mechatronics
5. ASIC Design
6. Neuro-Fuzzy Systems

Lab facilities

Advanced Microprocessor Lab, E-CAD Lab, VLSI Lab, Digital Communication Lab, Electronics Circuits Lab, Edwin Software, Virtual Modelling Systems.

Electronics and Biomedical Engineering

Core Subjects

1. Signal Processing
2. Electronic Circuits and Design
3. Digital Electronics
4. Integrated Circuits and Design
5. Bio Instrumentation
6. Medical Image Processing
7. Object Oriented Programming

Electives

1. VLSI Design
2. Embedded Systems and Applications
3. Artificial Neural Networks
4. Computer Communications
5. Computer Graphics
6. Mechatronics
7. BioMEMS and Nanotechnology

Lab facilities

Medical Electronics Lab, Signal Processing Lab, Microprocessor Lab, Digital Electronics Lab and Integrated Circuits Lab

Electrical and Electronics Engineering

Core Subjects

1. Electrical Machine Design
2. Fluid Mechanics and Heat Engines
3. Flexible AC Transmission Systems
4. Power Quality
5. Control Systems
6. Power Systems
7. Digital Signal Processing

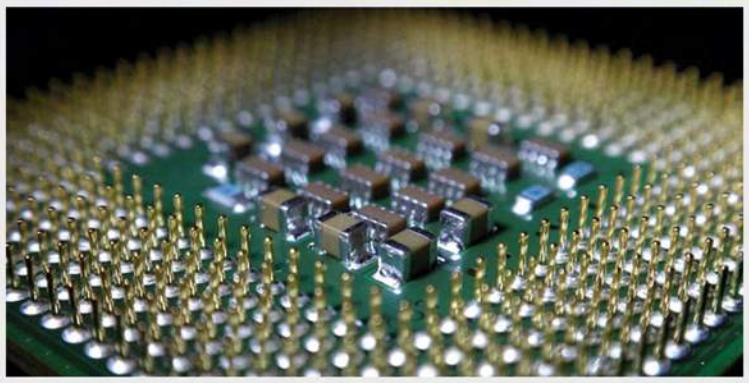
Electives

1. Mechatronics
2. Flexible AC Transmission Systems
3. Power Quality
4. Advanced Microprocessors
5. Image Processing
6. Wireless Communications
7. Soft Computing

Lab facilities

Measurements Lab, Machines Lab, Electronic Circuits Lab, Digital Electronics Lab, Microprocessor and Microcontroller, Power Electronics.

M.Tech



VLSI and Embedded Systems

Core Subjects	Electives
1. Advanced DSD	1.Embedded LINUX Systems.
2. VLSI Technology and Design	2. VLSI Design and Automation
3. Designing with Microcontrollers	3. Embedded and Real Time Systems
4. Analog Integrated Circuit Design	4. System on Chip Design
5. Advanced DSP and Architecture Design	5. High Speed Digital Design
6. Embedded System Design	6. CPLD & FPGA Architecture

Signal Processing

Core Subjects	Electives
1. Fundamentals of Spectral Estimation	1. Multirate Signal Processing
2. Advanced Digital System Design	2. Digital Signal Processors
3. Digital Communication	3. Array Signal Processing
4. VLSI Architecture for Communication	4. Signal Compression Techniques
5. Adaptive Signal Processing	5. Wavelet Transforms Theory and Applications
6. Digital Image Processing	6. Artificial Neural Networks

Optoelectronics and Communication Systems

Core Subjects	Electives
1. Digital and Optical Signal Processing	1. Laser Technology
2. Fiber Optics	2. Modern Optics
3. Optoelectronics	3. Communication Networks
4. Biophotonics	4. Laser based Instrumentation
5. Optical Communication Technology	5. Integrated Optics
6. Optical Sensor technology	6. Industrial Photonics

Image Processing

Core Subjects	Electives
1. Digital Image Processing	1. Artificial Neural Networks and Fuzzy Systems
2. Computer Graphics	2. Data Mining
3. Advanced Data Structures and Algorithms	3. Natural Language Processing
4. Computer Vision	4. Medical Imaging Techniques
5. Pattern Recognition	5. Data Compression
6. Random Processes	6. Distributed Computing

Energy Management

Core Subjects	Electives
1. Energy Conversion Systems	1. Economics of Energy Engineering
2. Solar Energy Engineering	2. Energy Systems Modeling and Analysis
3. Electrical Energy Systems and Management	3. Vehicle Power Management
4. Renewable Energy Technology	4. Heat Transfer in Energy Systems
5. Energy Conservation in Thermal and Electrical S/M	5. Emerging Refrigeration Technologies
6. Energy Audit and Management	6. Research Methodology