



Indian Institute of Technology Delhi



Instrument Design &
Development Centre



M.Tech
Instrument Technology

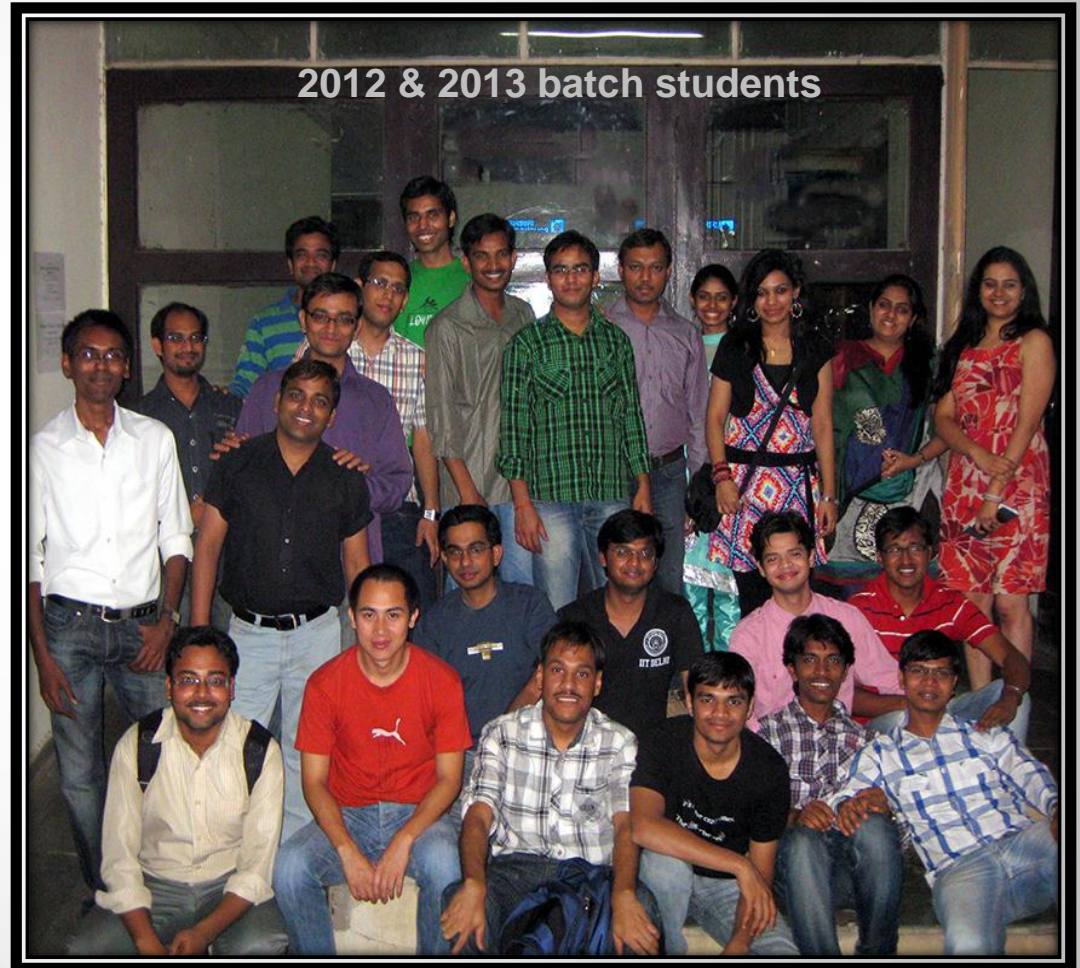


MASTERS IN INSTRUMENT TECHNOLOGY AT IIT DELHI

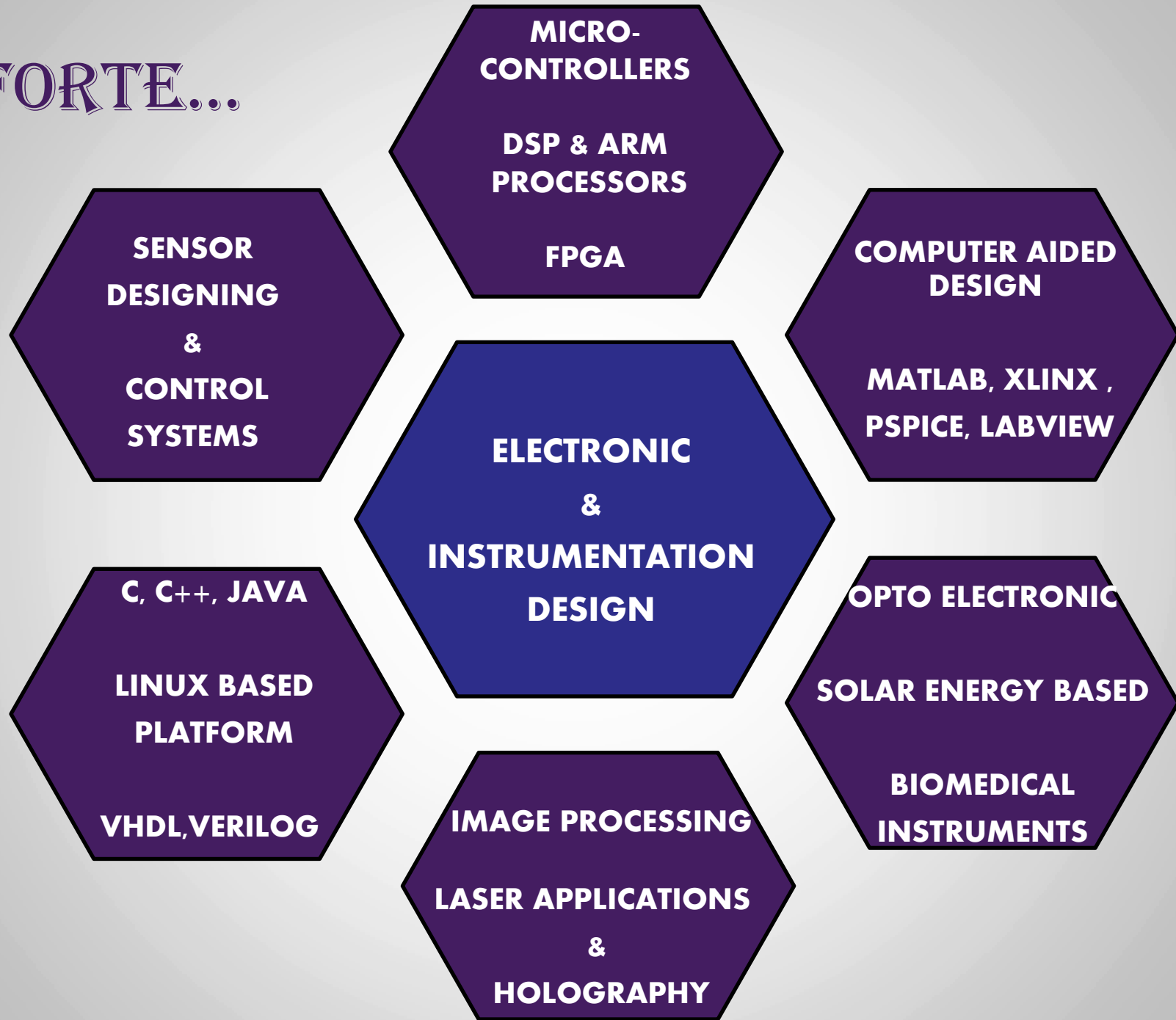
Masters in Instrument Technology is offered by **Instrument Design & Development Centre (IDDC)** an interdisciplinary center at IIT Delhi.

IDDC is engaged in sponsored R&D in Instrumentation from prominent industries, Science & Technology Institutions in private as well as public sectors.

“The post graduate students of IDDC contribute towards sponsored R&D activities via their Masters thesis projects.”

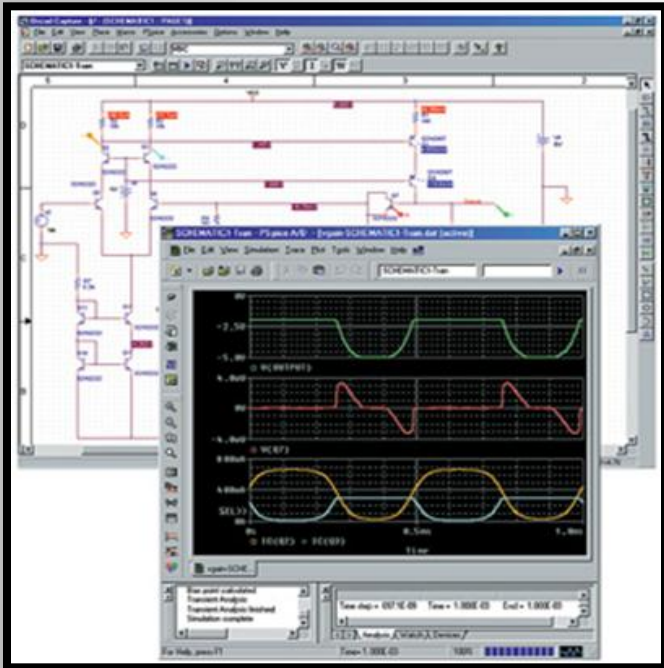


OUR FORTE...



LAB FACILITIES AT IDDC

The Instrumentation program provides comprehensive exposure in computer aided design, prototype development, full system integration and testing.



CAD & Simulation



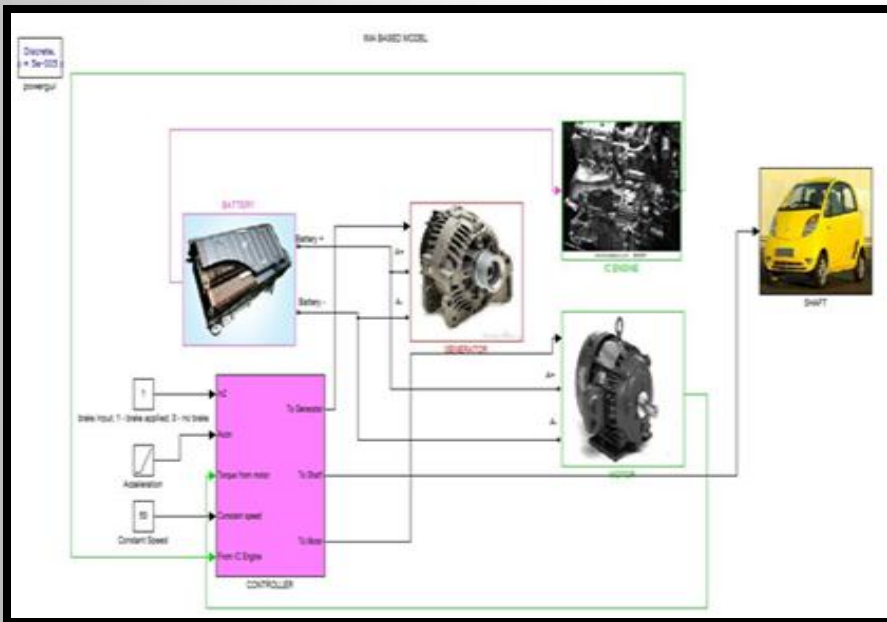
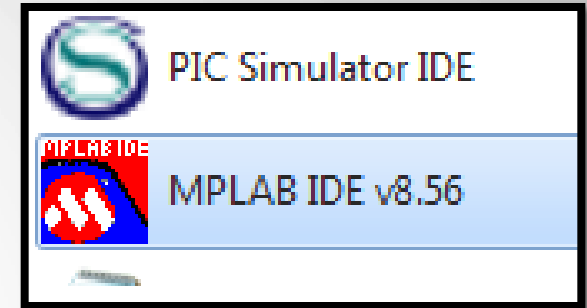
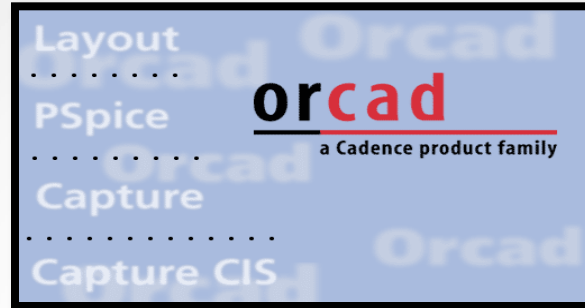
Prototype Testing



System Integration

COMPUTER AIDED DESIGN & SIMULATION LAB

This lab houses state of art simulation tools



Modelling of Hybrid Vehicle using SIMULINK

Tools used :

- **CADENCE - PSPICE**
- **MATLAB**
- **PSIM**
- **MPLAB**
- **Xilinx**
- **Hardware Description Language**

Some projects undertaken by students :

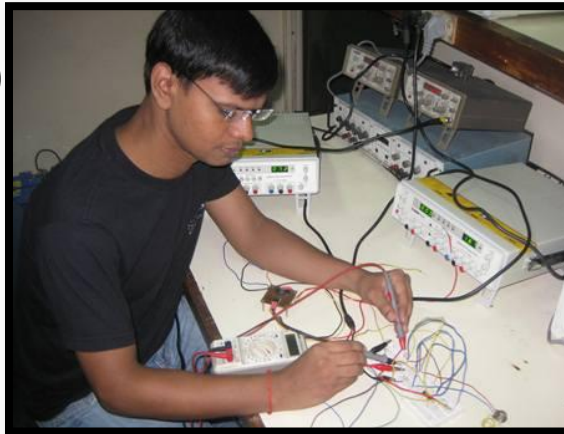
- **Optimization of Telecom Shelter**
- **Designing and Modeling of Solar Power Plant**
- **Solar power based irrigation pump**

MANPOWER DEVELOPMENT IN INSTRUMENT TECHNOLOGY (MDIT) LAB

MDIT Lab with core faculty from IDDC & EE Department constituted a **National Resource Centre** funded by **World bank & Department of Electronics, MHRD**, to form modern syllabi in Electronics & Microprocessors for regional engineering colleges & polytechnics in the country. The MDIT lab is equipped with best training facilities in Electronics Design.

INDUSTRIAL PROJECTS

- **Chemical Warfare Agent Detector- (DRDO)**
- **Development of DTE in existing Weapon System-(ARMY TECHNOLOGY BOARD)**
- **Automation of Sarvdhara Instrument -(INDIAN SYSTEM OF MEDICINE)**



Beagle Board xM

FACILITIES

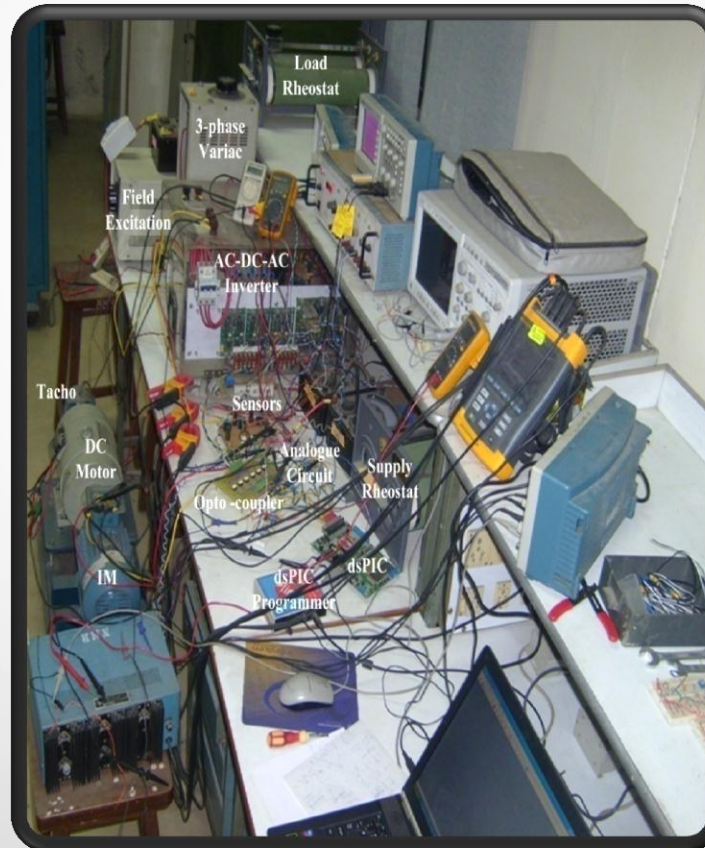
- **EMI, EMC Calibration Equipment**
- **Precision LCR meters**
- **ARM (LPC₂₁₂₉) kit**
- **BeaglexM, Microchip development boards**
- **High bandwidth DSO**
- **Microcontroller development boards**

NMR LAB

NMR Lab derives its name from development of a landmark **Nuclear Magnetic Resonance based seed oil measurement system sponsored by UNIDO**. Today it is a leading lab in contributing to power electronic subsystems like UPS, SMPS and motor control. Many designs are being used by industries of major branded products

INDUSTRIAL PROJECTS

- **Electronic Gun Capacitance Measurement** (*Samtel Colour Tube*)
- **Internal Voltage Stabilizers for AC** (*LG Electronics*)
- **High Power Pulse Generator** (*BHEL Haridwar*)



Solar PV based AC motor controller

FACILITIES

- **Vector voltmeter**
- **Power quality analyser**
- **Network spectrum analyser**
- **Vector impedance meter**
- **Wide sweep analyser**

ADVANCED INSTRUMENTATION LAB

Advanced Instrumentation Lab imparts hands on experience to students on full system design and implementation. The laboratory is equipped with complete range of Instruments for hardware and software support to carry out DSP based system design.

INDUSTRIAL PROJECTS

- **Wireless Body Area Network for Health Monitoring**
(UK India Education and Research Initiative (UKIERI))



Working with DSP Kit TMS320C5510

FACILITIES

- **Digital Signal Processor kit**
(TMS320C5510)
- **Advanced RISC Machine kit**
(TMS470P256)
- **Mixed Signal Processor kit**
(MSP430F4618)
- **Lab View PXI – 1042**
- **FPGA development kit**

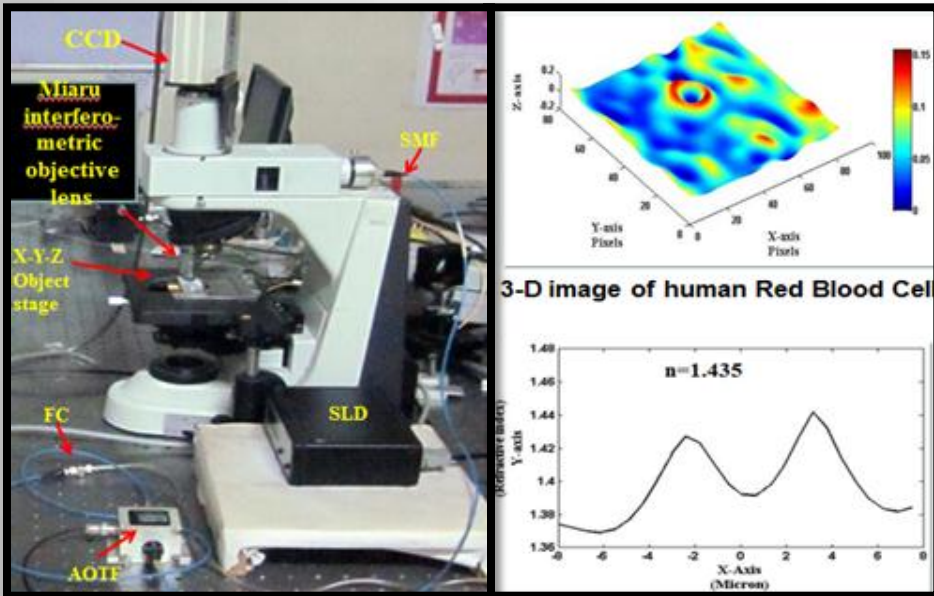
LASER APPLICATION AND HOLOGRAPHY



DSPI system for monitoring vibration and large deformations

This lab with high end equipment and facilities was established to develop systems for various precise measurements including that of refractive index, temperature and vibration

- Digital Speckle Pattern Interferometry (DSPI)
- Digital Holographic interferometric systems for measurement applications
- Rainbow and Display Holography
- Optical Coherence Tomography and 3D- Surface Profilometry
- Optical Tweezers and Application



Swept-source Optical Coherence Tomographic System

OPTICAL WORKSHOP

- Electro optical micro displacement sensor, knife edge test, Abbe refractometer, measurements involving high resolution moiré, etc.

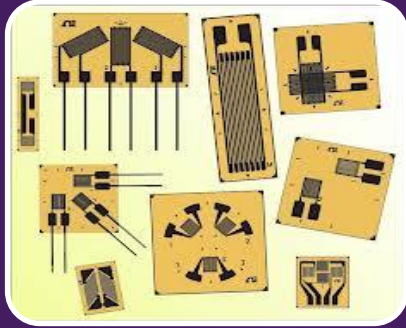
DEPARTMENTAL COURSES

- ***Instrument Transducers***
- ***Electronic Techniques for Signal Conditioning and Interfacing***
- ***Instrument design and simulation***
- ***Advanced topics in Instrumentation***
- ***Biomedical Electronics***
- ***Information Display Devices and technologies***
- ***Optical 3-D surface Profilometry and Tomography***
- ***Laser based instrumentation***
- ***Materials and Mechanical Design***
- ***Precision Measurement Systems***

SOME OPEN ELECTIVES

- ***Microelectronics***
- ***MOS VLSI***
- ***Digital Systems Laboratory***
- ***VLSI Design***
- ***Analog Integrated Circuits***
- ***Synthesis of Digital Systems***
- ***Embedded Systems***
- ***Design & simulation of Power Electronic Systems***
- ***Power Electronic Devices and DC Converters***
- ***AC Controllers***
- ***Electrical Drives***
- ***Sensor Array Signal Processing***
- ***Digital Image Processing***
- ***Architectures and Algorithms of DSP Processors***
- ***Object Oriented Programming with C++***
- ***Data Structures and Algorithms***

STUDENT PROJECTS...



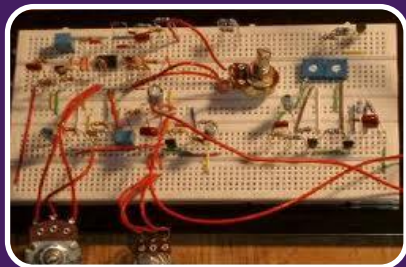
SENSING & CONTROL

- Thermocouple based precision temperature sensor
- Biochemical sensor design for electronic nose
- Design and automation of thread making process
- Speed control of BLDC motor for hybrid vehicle
- Design of MEMS based sensors for detection of hazardous gases



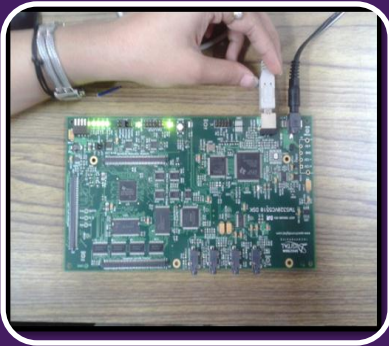
MICROCONTROLLERS

- Robotic system control
- Gun position control in weapon systems
- V/F control of induction motor using PWM



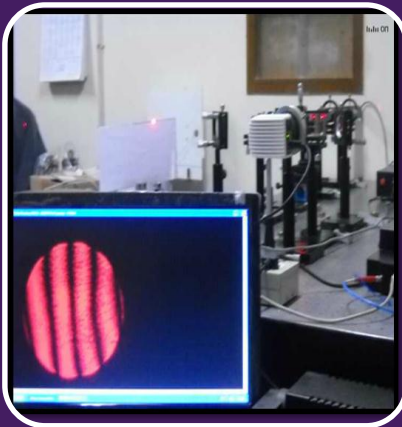
ELECTRONIC CIRCUIT DESIGN

- MOSFET parameter measurement
- High precision active bridge amplifier
- Low cost DC pico ammeter



DSP & COMMUNICATION

- MLSE based FIR filter
- Protocol for smart micro grid
- Low cost DAQ system and transmission via Ethernet
- Automated intrusion detection system



OPTOELECTRONICS AND BIOMEDICAL

- Sensor nodes for wireless body area network
- Magneto optic current sensor
- Vibration measurement
- Information display system with GPRS connectivity
- 3D shape measurement (Profilometry)
- Wrist pulse analysis for health diagnosis



OTHERS

- Solar micro inverter
- Fuzzy logic based image filtering
- Solar based LED display
- Telemetry processor on FPGA

INDUSTRIAL PROJECTS

- **Mobility Enhancement for the Elderly** (DST Govt. of India, 2009-2010)
- **Light out-coupling techniques for high-efficiency OLEDs** (CSIR, 2009-2012)
- **Data Terminal Equipment for Weapon System** (HQ , Ambala Cantt, Indian Army)
- **Swept-source optical coherence scanning microscopy for 3D-surface profilometry and tomography**(DST, Govt. Of India, 2009-2012)



Telecom shelter optimization by using less power for temperature regulation

[sponsored by : Bharti Airtel India Ltd]



Colloidal silica monitoring system for boilers

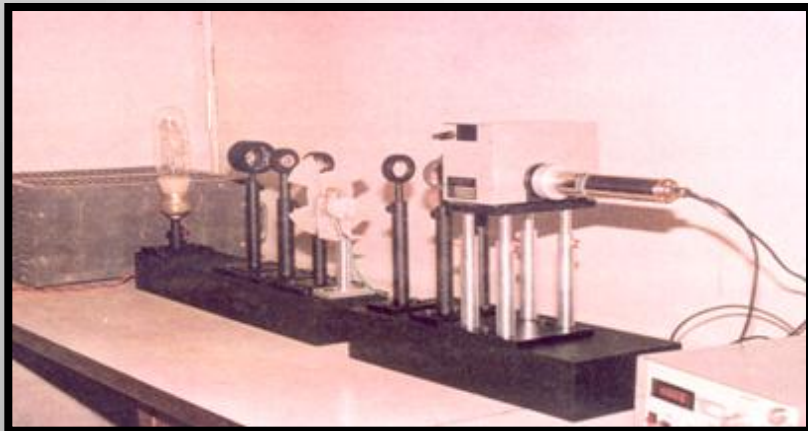
[sponsored by BHEL Corp. R & D Hyderabad]



High Power (100kW peak) Pulsed Waveform Generator for turbo generator R-C Blocks testing at BHEL

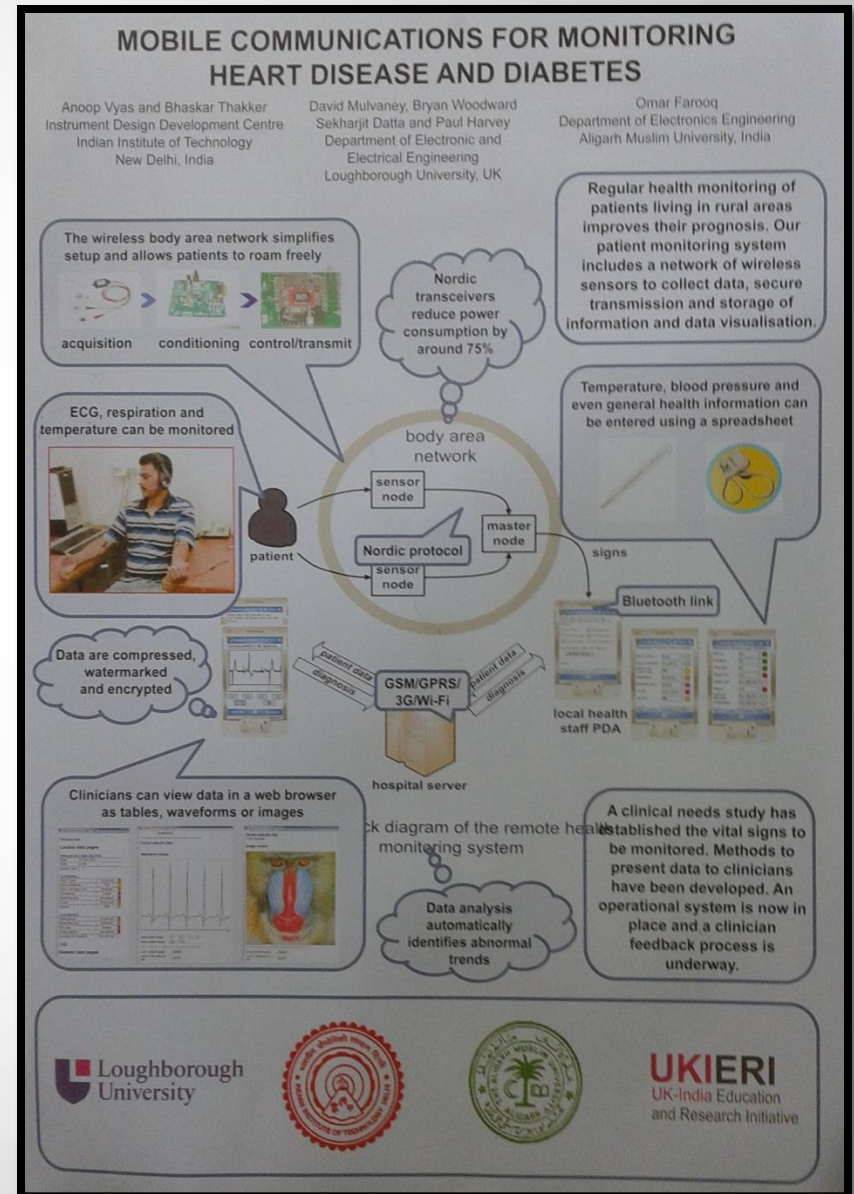
INDUSTRIAL PROJECTS (CNTD)

- Miniature ion mobility sensors (DRDO 2009-10)
- Mobile communications to improve monitoring of heart disease and diabetes (UKIERI British Council Division, 2007-11)
- Propagation studies on mobile IED pre-initiator System (OC Software Engg. Corp.)
- Digital holographic techniques for contouring of diffused objects and for measurement of temperature in gaseous flames (DST, Govt. of India, 2009-12)



Opto-mechanical system for plasma temperature measurement

[sponsored by : MHD Center, BHEL, Trichi]



RECENT PAST RECRUITERS (2008 - 2011)

- Intel Corporation
- Texas Instruments
- Freescale semiconductors
- Wipro VLSI
- AMD
- Aptina Imaging
- IBM
- Oracle
- Samsung
- Cisco
- Itaas
- Veritas
- DRDO
- BHEL
- BEL
- ST Microelectronics
- Connexant
- Motorola
- Wipro Embedded systems
- Siemens
- Eaton Corporation
- Sasken Communications
- NMS Communications
- FIBCOM
- BROADCOM
- Tejas Networks

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“We are what we repeatedly do; excellence, then, is not an act but a habit.” — Aristotle