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The Institute

The International Institute of Information Technology, Hyderabad (IIIT-H) is an autonomous university founded in 1998. It was set up as a not-for-profit public private partnership (N-PPP) and is the first IIIT to be set up (under this model) in India. The Government of Andhra Pradesh lent support to the institute by grant of land and buildings. A Governing Council consisting of eminent people from academia, industry and government presides over the governance of the institution.

IIIT-H was set up as a research university focused on the core areas of Information Technology, such as Computer Science, Electronics and Communications, and their applications in other domains. The institute evolved strong research programmes in a host of areas, with computation or IT providing the connecting thread, and with an emphasis on the development of technology and applications, which can be transferred for use to industry and society. This required carrying out basic research that can be used to solve real life problems. As a result, a synergistic relationship has come to exist at the Institute between basic and applied research. Faculty carries out a number of academic industrial projects, and a few companies have been incubated based on the research done at the Institute.

IIIT-H is organized as research centres and labs, instead of the conventional departments, to facilitate inter-disciplinary research and a seamless flow of knowledge within the Institute. Faculty assigned to the centers and labs conduct research, as well as academic programs, which are offered by the Institute, and not by individual research centers.

The Institute combines pioneering research with top class education. An innovative curriculum allows the student flexibility in selecting courses and projects. Students, even at the undergraduate level, get to participate in ongoing research and technology development - an opportunity unprecedented in India. As a result, a vibrant undergraduate programme co-exists with a strong postgraduate programme.

Recognizing that the goal of education is to develop a broad and humanistic outlook among students (and beyond), the Institute runs a unique human values programme at the undergraduate level. Regular faculty conducts the programme. Also, elements of the programme are made available to IIIT-H's postgraduate students, faculty and students at other universities and colleges, and any interested individual or organization.

In sum, the Institute offers students a unique environment that promotes culture, sports, societal contributions, art, self-governance and human values.

Governing Council

Prof Raj Reddy	University Professor of Computer Science & Robotics School of Computer Science Carnegie Mellon University (CMU), Pittsburgh, USA
Prof Rajeev Sangal (Ex-officio)	Director, IIIT-H
Prof Narendra Ahuja	Director (International), IIIT-H Donald Biggar Willet Professor of Engineering, University of Illinois
Shri Asutosh Mishra, IAS (Ex-officio)	Principle Secretary to Government of Andhra Pradesh Higher Education Department, Hyderabad
Shri M Gopi Krishna, IPS (Ex-officio)	Special Secretary to Government of Andhra Pradesh Information Technology & Communications Department, Hyderabad
Shri C Srini Raju	Managing Director, I-Labs Ltd., Hyderabad
Shri S Ramadorai	Managing Director, Tata Consultancy Services, Mumbai
Vice Chancellor	A university in Andhra Pradesh
Prof K C Reddy	Chairman, Andhra Pradesh State Council of Higher Education (APSCHE), Hyderabad
Shri Som Mittal (Ex-officio)	President, NASSCOM, New Delhi
Prof N Balakrishnan	Associate Director, Division of Information Science Indian Institute of Science (IISc), Bangalore
Dr M S Ananth	Director, Indian Institute of Technology, Madras
Prof M Rammohan Rao	Dean, Indian School of Business, Hyderabad
Prof Kamalakar Karlapalem (Ex-officio)	Dean (Academic), IIIT-H
Prof P J Narayanan (Ex-officio)	Dean (R&D), IIIT-H

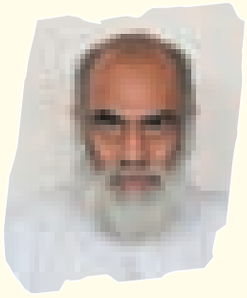
Faculty

R K Bagga
Ph D (Osmania University)
Advisor - Outreach
Research Areas: *Simulation of Air Defence Battle Management System, e-Governance*

Bruhadeshwar Bezawada
Ph D (Michigan State University)
Assistant Professor
Research Areas: *Network Security, Key Management, Secure Group Communication*

Prabhakar Bhimalapuram
PhD (Cornell University, USA)
Assistant Professor
Research Areas: *Thermodynamics, statistical mechanics, quantum mechanics*

R N Biswas
Ph D (University of California, Berkeley)
Visiting Professor
Research Areas: *Electronic Circuits, Microprocessor Architecture, Computer Networking*



Vineet Chaitanya
Ph D (IIT Kanpur)
Adjunct Professor
Research Areas: *Natural Language Processing, Vedant*

Suryakanth V Gangashetty
Ph D (IIT Madras)
Assistant Professor
Research Areas: Audio Processing

Vishal Garg
Ph D (IIT, Delhi)
Assistant Professor
Research Areas: *Task Control of lighting, heating, air-conditioning using fuzzy Logic; Smart occupancy sensors; Intelligent Buildings, Building Automation*

Rama Murthy Garimella
Ph D (Purdue University, USA)
Associate Professor
Research Areas: *Wireless Networks, Neural Networks, Performance Evaluation*

R Govindarajulu
Ph D (IIT, Kanpur)
Professor (Head, Education - Outreach)
Research Areas: *Programming Languages and Systems, Computer Architecture, Parallel Programming*

Prosenjit Gupta
Ph D (University of Minnesota)
Professor
Research Areas: *Network Security, Key Management, Secure Group Communication, Computational geometry*

Bipin Indurkhya
Ph D (University of Massachusetts)
Professor
Research Areas: *Cognitive Science, Cognitive Robotics, Metaphor and Creativity*

Amit Jain
Ph D (IIT, Delhi)
Research Assistant Professor
Research Areas: *Power System Operation, Planning, Economics and Reliability; Renewable Energy and Distributed Generation; AI Applications*

C V Jawahar
Ph D (IIT, Kharagpur)
Associate Professor
Research Areas: *Computer Vision, Multimedia systems, Pattern Recognition*

Kamalakar Karlapalem
Ph D (Georgia Institute of Technology)
Professor & Dean (Academic)
Research Areas: *Database Systems, Data Mining, Electronic Contracts & Workflow Technologies, Multi-Agent Systems*

C N Kaul
Ph D (IIT, Kharagpur)
Visiting Professor
Research Areas: *Mathematics, Computational Sciences*

Md Zafar Ali Khan
Ph D (IISc, Bangalore)
Assistant Professor
Research Areas: *Coding Theory, Space time codes, OFDN, Wireless, Signal processing for Wireless & MIMO*

Kishore Kothapalli
Ph D (John Hopkins University)
Assistant Professor
Research Areas: *Theory of Network Communication, Overlay Networks and Distributed Algorithm*

K Madhava Krishna
Ph D (IIT, Kanpur)
Assistant Professor
Research Areas: *Distributed Robotics, Distributed Sensor Networks, Cooperating & Collaborative Robotics, Multi-agent Systems, Intelligent Navigation*

Satyam Mandavilli
Ph D (IISc, Bangalore)
Visiting Professor
Research Areas: *Microelectronics, Semiconductor Junctions, MOS diode Structures, Polycrystaline silicon films, Semiconductors, Device modeling*

Abhijit Mitra
Ph D (IIT, Kanpur)
Professor
Research Areas: *Structural analysis of functional RNA molecules; QM and MM applications in biomolecular energetics and dynamics*

Chandrasekher Mukku
Ph D (Imperial College London)
UGC Research Scientist
Research Areas: *Gravitational Theories, Quantum Field Theory, Heat kernels, Dynamical Systems & Chaos, Computational Techniques*

Anoop Namboodiri
Ph D (Michigan State University)
Assistant Professor
Research Areas: *Pattern Recognition, Document Understanding, Machine Learning, Biometrics, Computer Vision*

P J Narayanan
Ph D (University of Maryland)
Professor & Dean (R&D)
Research Areas: *Computer Vision, Graphics, Virtual Reality*

Ram Bilas Pachori
Ph D (IIT, Kanpur)
Assistant Professor
Research Areas: *Signal Processing and Communications, Biomedical Signal Processing, Speech Processing, Image Processing*

Nita Parekh
Ph D (Jawaharlal Nehru University)
Assistant Professor
Research Areas: *Pattern recognition (viz., identifying repeats, Genomic Islands); Comparative Genomics and Data Mining; Dynamical systems modeling and graph theory approaches to biological networks*

Soma Paul
Ph D (University of Hyderabad)
Research Assistant Professor
Research Areas: *Computational Morphology, Computational Syntax & Semantics and Theoretical Linguistics*

Ramancharla Pradeep Kumar
Ph D (University of Tokyo)
Associate Professor
Research Areas: *Earthquake Engineering and Structural Dynamics, Earthquake Disaster Mitigation, Collapse structure Analysis and Simulation of Non-Engineered Buildings*

Kishore S Prahallad
MS (IIT Madras)
Senior Research Scientist
Research Areas: *Speech and Language Processing*

U Deva Priyakumar
Ph D (Pondicherry University)
Assistant Professor
Research Areas: *Computational Chemistry*

Vikram Pudi
Ph D (IISc, Bangalore)
Assistant Professor
Research Areas: *Data mining, Artificial Intelligence, Database systems*

K S Rajan
Ph D (University of Tokyo)
Associate Professor
Research Areas: *GIS, Remote Sensing, Sustainable Environment*

P R K Rao
Ph D (IIT, Kanpur)
Visiting Professor
Research Areas: *Communications, Controls and Information Processing Systems*

Shatrunjay Rawat
MS (BITS, Pilani)
Systems Associate Professor
Research Areas: *Computer Network Protocols, Information Security, System/ Infrastructure Design*

B Bhaskar Reddy
Ph D (IIT, Kharagpur)
Research Professor
Research Areas: Water Management, Cropping System, Integrated Nutrient Management

P Krishna Reddy
Ph D (Jawaharlal Nehru University)
Professor
Research Areas: *Data Management, Data/Web Mining, ICTs for Agricultural and Rural Development*

V U Reddy
Ph (University of Missouri)
Institute Professor
Research Areas: *Adaptive Signal Processing, Sensor Array Signal Processing, Broadband Access Technologies, Space-time signal processing in MEMO systems*

Rajeev Sangal
Ph D (University of Pennsylvania)
Professor & Director
Research Areas: *Natural Language Processing, Machine Translation, Artificial Intelligence*

G Savitha
Ph D (IISc, Bangalore)
Research Assistant Professor
Research Areas: Molecular Modeling, Docking, Structure-function in DNA-Protein Complexes, DNA repeats, DNA Architectures

Dipti Misra Sharma
Ph D (Delhi University)
Research Associate Professor
Research Areas: *Machine Translation, Linguistics*

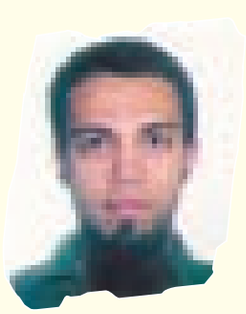
Harjinder Singh
Ph D (Princeton University)
Professor
Research Areas: *Theoretical chemical physics: molecular energetics and dynamics, electronic structure and properties calculations, noise induced processes, nano-bio systems*

Navjyoti Singh
M. Tech (IIT, Kanpur)
Visiting Professor
Research Areas: *Formal Ontology, Scientific Study of Consciousness, Foundations of Logic, Mathematics and Linguistics, Crossroads of Science and Indian Analytic Traditions, History, Philosophy of Science*

Jayanthi Sivaswamy
Ph D (Syracuse University)
Professor
Research Areas: *Medical imaging, computer/biological vision, IT for education*

Kannan Srinathan
Ph D (IIT, Madras)
Assistant Professor
Research Areas: *Security, Distributed computing, Cryptography, Algorithms*

M B Srinivas
Ph D (IISc, Bangalore)
Associate Professor
Research Areas: *High-Performance Logic Design and Architectures, High Speed VLSI Arithmetic, nano-CMOS circuit design*



Azeemuddin Syed
Ph D (Southern Illinois University, USA)
Assistant Professor
Research Areas: *Radio Frequency Integrated Circuits, Integrated Photonics*

Vasudeva Varma
Ph D (University of Hyderabad)
Associate Professor
Research Areas: *Information Retrieval, Extraction and Access Technologies (IR, IE and IA), Software Engineering, Software Architecture*

V Ch Venkaiah
Ph D (IISc, Bangalore)
Associate Professor
Research Areas: *Data Compression, Cryptography, DSP, Combinatorial Optimization, Computational Number Theory, Mathematical Programming, Linear Algebra*

M Venkateswarlu
Ph D (University of Waterloo)
Visiting Professor
Research Areas: *Finite element methods in applied mechanics and Electro magnetism, Signal processing applications, Random Vibrations, Stochastic Processes*

K Viswanath
Ph D (Indian Statistical Institute, Calcutta)
Visiting Research Professor
Research Areas: *Mathematical Foundations of Computer Science and Pedagogical Issues*

B Yegnanarayana
Ph D (IISc, Bangalore)
Professor & Microsoft Chair
Research Areas: *Digital Signal Processing, Speech, Computer Vision, Neural Networks*

Distinguished Faculty

Dr APJ Abdul Kalam, *Former President of India*

Prof Narendra Ahuja, *Donald Biggar Willet Professor of Engineering, University of Illinois*

Dr M Vidyasagar, *Executive Vice-President, Advanced Technology Centre, TCS*

Prof K V Nori, *Chief Information Officer, TCS*

Prof Ashok Jhunjhunwala, *IIT Madras*

Dr P Anandan, *Microsoft Research India*

Prof M Ramamoorty, *IEEE Fellow, Former DG, CPRI & Advisor, ERDA, Vadodara*

Adjunct Faculty

Mark S Nixon
University of Southampton
Image processing and computer vision

B Gopalakrishnan
Tata Consultancy Services
Protein Biophysics, NMR of Biomolecules, Ligand-Receptor Interactions & Structure/ Activity/Property- Based Computer-Aided Drug Design

Ramesh Loganathan
Progress Software
Middleware Systems, Distributed Computing and Distributed Architecture

Lakshmi Bai A
Formerly Professor, Osmania University
Hindi Grammar, Child Language Acquisition, Contact and Convergence among Indian Languages

Ram Prakash Gupta
Crompton Greaves Limited
Power Systems

A Rameshwar
Formerly Professor, ANGRAU
Bio-informatics

Lin Chase
Accenture Technology Labs, USA
Semantic data integration, Business process modeling and Service-oriented architecture, AI, Robotics and Speech Recognition Technologies

Chanchal K Mitra
University of Hyderabad
Proteins and Nucleic Acid, Bioelectrochemistry

Lecturers

JVR Ravindra
High Speed Interconnects, Low power digital circuits, Carbon Nano tubes and Digital signal processing

V Sriram
Statistical Machine Translation, Analysis of Multi-word expressions and applying machine learning to NLP

V R Satyanarayana
Query processing and optimization, Data Clustering, Graph Mining and Materialized Views

Kirti Garg
Software Architecture, Software Engineering Education, Software Security, Project Management

E Vijay Prakash
Digital Signal Processing, Speech Processing and Applications, Real Time Computer Control of Embedded Systems

Hari Kiran Vege
Sensor Networks

Sonal Nimbkar
Bharata Natyam & Performing Arts

Academic Programmes

The Institute offers challenging academic programmes, at undergraduate and postgraduate levels, which encourage students to not only excel in course work but also carry out leading edge research in a chosen specialization.

B Tech Programme:

The undergraduate programme is designed to provide core concepts and skills in the broad areas of *engineering, sciences, mathematics* and *humanities*, and practicums, in the first two years. The practicums are intended to give students a first-hand understanding of leveraging the enormous power of information technology and applying it to develop innovative solutions for real-life problems.

In the later two years, students enroll in advanced courses either to *deepen* understanding and skills in a chosen specialization, or to *broaden* knowledge and skills in applying information technology.

A **unique feature** of IIIT-H's *B Tech programme* is the strong encouragement and abundance of opportunities it provides students to do top class research. *This is how a large number of IIIT-H's undergraduate students have come to publish in prestigious journals, and top national and international conferences*.

M Tech Programme:

Postgraduate programmes allow students to specialize in chosen areas of interest, and prepare them for specialized jobs in industry. In the first semester, students learn core concepts and get to do extensive laboratory work, while in the later semesters, students enroll for advanced courses and work on various projects to gain expertise in chosen areas of interest.

M Tech progammes in domain areas enable students to gain proficiency in computing skills and the chosen domain. *For example, civil engineers* get to train in *computer aided structural engineering (CASE), science specialists in computational natural sciences, and linguists in computational linguistics*.

Postgraduate Research Programmes:

These are IIIT-H's premium research programmes intended to prepare students for careers in research.

Currently, the institute offers the following four programmes.

- *PhD programme*
- *Masters by Research programme (MS by Research)*
- *Dual degree* programme in *computer science & engineering (CSE)* or *electronics & communication engineering (ECE), leading to the award of B Tech* plus *MS by Research* degrees.
- *Post-BSc programme* in computational natural sciences, leading *to the award of B Tech* plus *MS by Research* degrees.

These programmes are designed to provide students opportunities to conduct in-depth research in a chosen area of specialization, allowing them to acquire *deep domain knowledge, critical analytical capabilities, strong research skills,* and *flair for innovation*.

Undergraduate Programme

IIIT-H offers the following two types of *core* and *dual degree programmes* at the undergraduate level.

Core Programmes

- *B Tech* in *Computer Science & Engineering (CSE)*
- *B Tech* in *Electronics & Communication Engineering (ECE)*

Dual Degree Programmes

- *Five-year Dual-degree Programme* leading to *B Tech* and *MS by Research (in CSE or ECE)*.
- *Four-year post B Sc Dual-degree Programme* leading to *B Tech (CSE)* and *MS by Research in Computational Natural Sciences*

The core undergraduate programme is offered in two streams – *Computer Science & Engineering* (*CSE)* and *Electronics & Communications Engineering* (*ECE)*. The first year of the programme in both streams is similar, and is intended to ensure a common background in *the core concepts of computer science* and *electronics and communications, exposure to humanities, skills* and *human values*. The second year is aimed at strengthening their knowledge in chosen areas, while offering sound exposure to *pure sciences, engineering and humanities streams*.

A student enrolled in *CSE* can take *ECE* courses as electives, and vice versa. Also, the core programme allows students to switch to the *dual-degree* (*B Tech* plus *MS by Research*) in any of the sub-areas within *CSE, ECE, Engineering, Sciences* and *Humanities*.

B Tech in *CSE*

The CSE programme is designed to create talent to carry out research. Students are given a strong foundation in *CSE* that includes *electronics* and *hardware*. Computer science courses are introduced in the early semesters, and non-IT courses in the later stages. This allows students to master the subject and carry out projects in the related subject starting from the second year. *IT Workshops* are specially designed courses meant to impart mastery in the use of the latest software technologies by the third semester. The courses in *mathematics, sciences, engineering* and *humanities* enable students to explore the wider applications of information technology.

B Tech in *ECE*

The ECE programme is designed to create talent to carry out research. Students are introduced to core courses that include *programming, data structures, linear algebra, probability* and *random processes*. ECE courses like *electronics, signals & systems, communications, VLSI,* and *embedded systems* are introduced in the early semesters. *Electronics Workshops* are specially designed courses intended to give students hands-on experience in electronic circuit design in the third and fourth semesters. Advanced courses and electives in later years enable students to specialise in *communications, signal processing, robotics, VLSI, embedded systems,* and *other streams*.

B Tech (Honors)

The *B Tech (Honours) programme* in CSE/ECE is intended to allow bright and motivated students to aim higher, and put in extra, focused academic work in research. Students take three prescribed courses in the chosen stream, and an in-stream summer training at a research centre or in industry, and enroll for additional eight projects credits. Besides, students will have to attend a specially designed summer camp where leaders in the field will speak. It is mandatory for the Honours students to do the final-year project in their selected streams.

Presently, some of the streams available for Honours students are: *AI and NLP, Visual Information Processing, Data Engineering, Communication Engineering, VLSI and Embedded Systems, Security, Algorithms and Computation Theory and Robotics*.

Dual Degree B Tech and MS by Research programme

This is a five year integrated course offered to meritorious undergraduate students, at the end of the third year. Students enroll for extra courses at the end of their third year and complete the first year equivalent of the *MS by Research programme*, while in the final year of the undergraduate programme. Dual Degree option enables students to acquire two degrees – *B Tech (Hons)* and *MS by Research* by successfully defending MS thesis. The normal duration for dual degree programme is five years.

Post-BSc Dual Degree B Tech-MS by Research programme

This is a four year integrated course offered to *B Sc* students who have trained in *Physics, Chemistry* and *Mathematics*. Students study the core computer science concepts in the initial years, and proceed to work on a Masters thesis in *computational natural sciences* and *bioinformatics*.

Curriculum

An institute's curriculum is a measure of the competence students would achieve through its study.

IIIT-H's curriculum is designed to train students to carry out research. Listed below are some of the highlights of the Institute's curriculum.

- Offers breadth not only in the core *CSE/ECE*, but in *Humanities, Sciences, Mathematics* and *Engineering*.
- Facilitates depth in *CS/ECE*.
- Allows undergraduate students to convert to the Dual Degree program – *B Tech (Hons)* plus *MS by Research* in IT or a domain area.

The curriculum consists of

Institute Core: The core consists of semester specific compulsory courses. All undergraduate students should satisfy the institute core requirement. These courses are *Mathematics, Sciences, Engineering, Human Values*, and *Humanities*. IIIT-H considers inculcation of ***human values*** an integral part of education, and therefore offers mandatory courses in *Human Values* in the first two semesters of the undergraduate programme.

Courses in CSE/ECE: These courses, covering specific areas of *CSE/ECE*, are *a must* for students. Students have the flexibility to decide on which courses to choose in which semesters according to their preferences and in consultation with their academic adviser. A course can be taken early on for a rapid entry into a particular field or can be deferred to a later semester to allow taking an elective or course of immediate interest or need.

Disciplinary Electives: These are elective courses within the discipline of *CSE/ECE*, and are offered each semester, starting second year. Elective courses provide the students with in-depth knowledge, and students are advised to choose elective courses according to the field of their interest.

Other Electives: Open Electives are courses outside the discipline of *CS/ECE*. There is a minimum number of *open electives* that all students have to complete. These are advanced courses from the broad areas of *Engineering, Sciences, and Mathematics*. The first two years provide the foundation required for taking these courses.

Humanities and Social Sciences: These are a complementary set of courses intended to ensure the overall development of students. Courses offered in this category include *Philosophy, Society, Economics*, *Indian Analytical Traditions* (covering *Panian Grammar, Nyaya,* and *Ontologies),* and *Theories of Music, Dance*, and *Drama*.

Projects: *Practice-Theory-Practice*. This is the paradigm of IIIT-H's curriculum. Practicum is an integral part of the curriculum, and many courses feature a '*practice*' component, which requires programming, working on embedded systems, or using computational tools to understand the concepts studied in sciences. The curriculum also can require students to write term papers in various subjects (like *humanities*). Further, students can take projects in areas of their interest. The *B Tech project (BTP)* has a year-long practicum that helps students to showcase their understanding in a specific area by solving a problem, building a system, or making a major technological advance.

Industrial Interaction: The curriculum provides students the opportunity to take up summer internships in industry. This is aimed at exposing them to the world of work, and giving a first hand experience of working on projects in industrial environment. Since a lot of industrial projects are carried out by IIIT-H's *Research Centres* and *Technology and Consultancy Centres*, both undergraduate and postgraduate students also get the opportunity to work on real-life projects.

Postgraduate Programmes

The Institute has postgraduate programmes in IT as well as Domain areas.

AREAS	PROGRAMMES
Computer Science & Engineering	*M Tech, MS by Research, PhD*
VLSI & Embedded Systems	*M Tech*
Electronics and Communication Engineering	*MS by Research, PhD*
Computational Linguistics	*One year PG Diploma, M Tech, M Phil, PhD*
Computer Aided Structural Engineering	*M Tech, MS by Research, PhD*
IT in Building Science	*MS by Research, PhD*
Computational Natural Sciences and Bioinformatics	*MS by Research, PhD*
Bioinformatics	*M Tech*
Computer Science and Information Security	*M Tech*
IT for Power	*MS by Research, PhD*

IIIT-H offers postgraduate programmes (PG programmes) in a range of specializations, in full-time and part-time formats. Many of the PG programmes are supported by research centres, and are aligned to the research centres' major areas of interest and work. Please look at the respective *research centers'* description for their areas of work.

PhD

It is a research programme with emphasis on the dissertation work. To ensure the necessary depth and breadth in the area chosen for research, students are required to do course work and clear the qualifiers. Typically students plan their PhD study based on their background and in consultation with their program chair. Upon clearing the requirements and the acceptance of their research proposal, the student works on the thesis, and its successful defense leads to the degree.

MS by Research

This is a research-oriented Masters' programme, normally lasting two years and culminates in a thesis defense. Students can take advanced courses in the chosen area of specialization and devote a year or more towards research. Exceptionally well prepared students can directly start working on research thesis in the first year itself. In most cases, students receive financial support, and are encouraged to publish their work in conferences and journals.

M Phil (Compuational Linguistics)

This programme provides students an understanding of natural language as viewed from computation. It prepares them to understand computational models and how natural language data can be prepared or analyzed while building systems.

The programme is specially designed for *linguists, language scholars, Sanskrit scholars* and *the likes*. Students with a science or mathematics background and with a strong interest in the analytical or computational study of language too can pursue this program.

M Tech

The two-year M Tech programme, designed to help graduates and working professionals enhance their professional qualifications and career prospects, imparts advanced knowledge in one or more specialized areas, listed in the table above.

In the first year, students acquire the background knowledge of the chosen field, and in the second year, students gets to study advanced courses and do projects on campus, or in industry.

Part-time Programmes

The PG Students Status Programme (PGSSP) allows industry professionals to take independent courses, one at a time, in areas of their interest, without needing to enroll in a full-time degree programme.

External PhD Programme

This programme allows out-of-town candidates to enroll for PhD and do substantial research at their home Institute. However, students will have to fulfill a residence requirement of two semesters.

Research Exchange Programme (RExP)

The research exchange prorgamme allows PhD students to spend an equal amount of time at the Institute and at the partner research group overseas. Students enrolled in this programme will have a chance to study at and obtain the doctorate degree from the university of the partner group. Currently, the Institute has partnership (RExP) agreements with leading research groups from *Carnegie Mellon University, University of Pennsylvania* and *University of Illinois*.

Administration

The institute has an efficient administrative organization, well supported by a suite of up-to-date information systems built in-house. Administrative policy decisions are made by committees consisting of faculty, and implemented by the various units of the administration. Listed here are some of the key administrative units.

Academic Office

The academic office provides the support for conducting teaching, examinations, academic related work and admissions. Academic office uses ISAS, an online student administrative system that facilitates students' registration of courses and transcript preparation.

Administration

The administrative office is responsible for non-IT facilities' management. This includes reception, logistics, security, on-campus guesthouse, gardens, and upkeep of institute's infrastructure.

Engineering

The engineering department handles the long-term planning of the physical development of the campus. This includes construction of new buildings and carrying out major repairs to existing buildings. IIIT-H's Earthquake Engineering Research Center and Center for Building Science Research assist the engineering department in carrying out structurally and energy efficient designs of proposed construction.

Hostel

The hostel office manages the rooms in the hostels and implements the institute hostel policies. The caretakers of the hostels respond to day-to-day issues, and the faculty wardens provide guidance.

Accounts

The accounts office administers project finances for all the Research Centers, faculty and staff payroll, student and vendor accounting. Besides, it is responsible for budgeting, auditing and other finance related issues.

Systems

The systems office is responsible for maintenance of IT infrastructure consisting of large, campus wide wired and wireless networks, an array of high end servers, and upkeep of desktop and laptop computers of various specifications assigned to faculty, staff, and students.

Library

The library has a competent and well-trained staff that manages a vast range of library assets – books, national and international journals, on-line catalogs and other material. The library is open much of the night and on holidays too, and staff assists students and faculty in finding academic material with ease.

Education (Outreach)

Education Outreach has been set up to showcase academic and research initiatives of IIIT-H to other engineering colleges in the country, and strengthen their education and research.

Education Outreach oversees the following events and programs.

Research Exposure to Faculty & Students: IIIT-H provides opportunities for students and faculty from other engineering colleges to participate in the institute's research projects. Students who perform well and demonstrate an exceptional academic record are considered for admission to IIIT-H's integrated master's programme.

R&D Showcase: This is an annual event where IIIT-H's centers and labs display and demonstrate their research achievements to the public. It has particularly attracted industry professionals, faculty and students from other colleges, and media persons, and has led to many industry collaborations and technology transfers.

Excitement of Research (ExOR): This is a unique initiative to stimulate interest in research among students & faculty of other engineering colleges. The annual event features workshops on specific topics and inspiring talks by academicians and industry leaders. Demos and posters of research carried out at IIIT-H's various research centers also go on display.

Training for Faculty & Students: Education Outreach runs a project funded by the Ministry of Communication & Information Technology (MCIT), Government of India to improve the quality of the existing and aspiring engineering faculty through training in various software technologies.

MSIT: The Master of Science in Information Technology is an innovative inter disciplinary, multi-University, postgraduate programme. In addition to regular classes, sophisticated multi-media infrastructure is used for lectures and course delivery. The aim of the MSIT programme is to identify high-potential candidates from engineering colleges and upgrade their skills. The emphasis is on learning by practical experience, project & product development process and soft skills.

Academic Events (Outreach)

The outreach division was established to strengthen executive education; interface with industry, statutory bodies, professional societies; conduct and research focus lectures, workshops, seminars and conferences; create awareness of IT for Industry and Society in emerging technologies.

RECENT CONFERENCES

- Future Directions in Higher Education: Role of Apex Institutions (RAI-2008)
- 1st India Software Engineering Conference (ISEC-08)
- 3rd International Joint Conference on Natural Language Processing (IJCNLP-08)
- 20th International Joint Conference on Artificial Intelligence (IJCAI-07)
- Asian Conference on Computer Vision (ACCV-2006)

'e-Governance Initiatives in India' book release during CSI-2007 at Bangalore

RESEARCH PROJECTS

Computer Society of India has funded two yearly Research Projects for evaluation of e-Governance Initiatives in India and extended to the District level in 2008.

RECENT DISTINGUISHED LECTURES

- *'Right to Information and Social Action'* by Dr Sandeep Pandey
- *'How to appreciate Music?'* by Dr Mangalampalli Balamuralikrishna
- *'Research and Innovation for Survival, Sustenance and Growth'* by Dr Prahlada
- *'A Perspective View of Information Technology'* by Prof Sanjay G Dhande

ISEC'08 Panel Discussion

ANNUAL WORKSHOPS

Excitement of Research (ExOR): Workshop aimed at undergraduate students from various colleges to enthuse them about research possibilities and careers. (Since 2004)

R&D Showcase: An exhibition demonstrating major IIIT-H research projects. (Since 2003)

Robocamp: One-week workshop aimed at undergraduate students from various colleges. (Since 2006)

IJCNLP-08 Opening Ceremony

FORTHCOMING CONFERENCES

- International Conference on Natural Language Processing (ICON)
- Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)
- World Wide Web (W3C) in 2011

Team
R K Bagga
Vijay

IJCAI-07 Inaugural function

Industry (Outreach)

Close collaboration with the industry is an important element of the original vision of IIIT-H as it helps focus our research on real-world problems. The institute has an active and structured industry outreach programme to connect the institute's research and academics with the needs and demands of the industry. We also aspire to produce research and technologies that will chart the path of tomorrow's industry. The engagement can happen at the institute level, at a research group level or at the level of a faculty member.

We have several engagement models in place for working with the industry on research.

- **Sponsored research:** A team of students and faculty members executes projects at the institute in collaboration with the company that sponsores the project. Microsoft (Redmond and Bangalore), Nokia, Satyam, Philips Research, IBM, Google, CA, TCS and HP Labs are some of the companies that have engaged with the institute under this model in the past three years.

- **Nurture-an-area:** This is a unique engagement model through which a company can fund research in a broad area of their interest, with a few desirables as goals. A team of research students, UG students, and faculty carry out the open research. The results include the team trained in the relevant areas as well as specific intellectual property generated in the process. Infosys and Rediff have engaged with the institute under this model in the past year.

- **Fellowships and travel grants:** In addition, Microsoft Research, GE, SAP Labs, Infosys, and other companies have been providing fellowships and travel grants to research students.

- **Industry affiliates:** We are setting up an affiliate network to promote continuous engagement with the industry. Members get privileged access to the institute, its research, events, and IPR.

Engagement with the industry also includes providing consulting services by our faculty members. This is important in spreading the expertise and outcome of our research to the industry and to society. The institute actively encourages its faculty members to consult for the industry.

Campus placements are seen at IIIT-H in a broader framework of engaging with the industry. Our placements are designed to place the outgoing students in research, product architecture, design, or development. We strive for personalized placement of research students of the MS/PhD programmes into groups and areas where their research training and skills can contribute the most.

Several corporates have participated in offering cutting-edge courses or in setting up laboratory facilities at the institute. This provides an avenue to expose our students to real-world needs, problems, tools, and techniques. Some of the companies who have involved with us in this manner are, among others, PortalPlayer, Nvidia, GE, Pramati Technologies, IBM, Microsoft, and Intel.

Industry outreach is also active in promoting entrepreneurship as a means for the creators of research to take it directly to the users. We encourage and help students, alumni, and faculty with developing their ideas into products or services. We also support incubation of companies and connect them with potential clients and investors.

Research Centres & Labs

Research Centres and Labs below are listed area-wise and grouped based on their focus on technology domains. At times, technology centres foray into domains, and domain centres into technology. Development centres use technology in innovative ways or in unusual domains.

Technology

Communications (CRC)
Data Engineering (CDE)
Languages Technologies (LTRC)
- Natural Language Processing & Machine Translation (NLP-MT)
- Search and Information Extraction (SIEL)
- Speech
- Anusaaraka

Robotics (RRC)
Security, Theory and Algorithms (C-STAR)
Software Engineering (SERL)
Visual Information Technology (CVIT)
VLSI and Embedded System (C-VEST)
Compilers (CL)

Domains

Agriculture and Rural Development (ARD)
Building Science (CBS)
Cognitive Science (CS)
Computational Linguistics (See under LTRC)
Computational Natural Sciences and Bioinformatics (CCNSB)
Earthquake Engineering (EERC)
Education (cITe)
Education Technology and Learning Sciences (CETLS)
Exact Humanities (CEH)
Power Systems (PSRC)
Spatial Informatics (LSI)

Development Centres

Engineering Technology and Innovation Centre (ENTICE)
Innovation and Entrepreneurship (CIE)
Open Software (COS)
Societal and Human Applications of Artificial Intelligence (SAHAAI)

Communication Research Centre (CRC)

CRC was set up in 2003 with the goal of undertaking fundamental research in Signal Processing and Communication Engineering. The Center is well supported in infrastructure and research resources through the Institute as well as through various sponsoring agencies and some industries

The current areas of research

- Statistical and Adaptive Signal Processing
- Wavelets and Multirate Signal Processing
- Multi-Dimensional Signal Processing
- Signal Processing for Communications
- Sensor-Array Signal Processing
- Speech and Image Processing
- Bio-Medical Signal Processing
- Communication Theory
- Modulation and Coding
- MIMO Communication System
- Wideband Communications
- Communication Networks
- Neural Network and Cybernetics
- Optical Communication
- RF Integrated Circuits (RFIC)
- Integrated Photonics
- Design, Simulation and Fabrication of Integrated Components for Communications
- Wireless Sensor Networks

WLAN Workshop

Faculty VU Reddy, Azeemuddin Syed, Rama Murthy Garimella, Ram Bilas Pachori, PRK Rao, Zafar Ali Khan

Centre for Data Engineering (CDE)

CDE conducts research, facilitates technology transfer, and builds systems in the broad area of data engineering.

Some focused research areas

- Database systems - Query Optimization, Transaction Processing, and Performance Modeling and Simulation
- Data Mining and Data Warehousing & Text and Web Mining
- Data Dissemination and Personalization
- Electronic Contracts and Workflow Management Systems
- Multi Agent Systems and Complex Systems Simulation

Current Projects

- Web-based Agriculture Dissemination Systems - MCIT
- Nurture Business Intelligence Area - Infosys
- Data/Information Capture, Dissemination, and Discovery Solution to Farmers in Remote Areas- Nokia
- Frequent-itemset-based classification - DST

The centre inculcates pleasure of doing research by involving students in activities such as:

- RoboCup Competitions
- Data Mining Challenges
- Deploying State of the Art Systems
- Enhancing Open-Source Database Systems
- Agriculture Games

Faculty

Kamal Karlapalem
P Krishna Reddy
Vikram Pudi

Language Technologies Research Centre (LTRC)

The LTRC addresses the complex problem of understanding and processing natural languages in both speech and text modes.

- LTRC conducts research on both basic and applied aspects of language technology.
- It is the largest academic centre of speech and language technology in India.
- LTRC carries out its work through four labs, which work in synergy with each other.

LTRC is also a lead participant in nation-wide mission-mode consortia projects to develop deployable technology in the areas of Indian Language Machine Translation, English to Indian Language Machine Translation, and Cross Language Information Access (search engines).

NLP-MT Lab

The NLP-MT lab does fundamental work on developing grammatical as well statistical models of language. Linguistic approaches are combined with machine learning leading to new theories and technology development.

This has resulted in higher accuracy parts-of-speech taggers, chunkers, constraint-based parsers as well as broad coverage statistical parsers, and semantic analyzers for Indian languages on the one hand, and annotated data including dependency tree banks, discourse banks, parallel corpora, etc. on the other.

Machine Translation (MT) work includes use of transfer-based approaches, as well as statistical approaches, using parallel corpora.

They utilize the language tools based on new models.

Work is going on in mission mode for building Indian language MT systems as well as English to Indian language MT system.

Anusaaraka Lab

Anusaaraka lab is concerned with development of machine translation systems which in addition to the usual machine translation output also allows a user to understand the source language text in a pseudo target language. For example, a reader who knows Hindi (the target language) would be able to read the English source text, in a pseudo Hindi output after a small amount of training.

The lab looks at MT from the point of view of information flow and preservation and information dynamics.

Search and Information Extraction Lab (SIEL)

The Lab focuses on solving research problems in the areas of Information Retrieval and Extraction using NLP techniques.

SIEL is engaged in building technologies for personalized, customizable and highly relevant information retrieval (IR), Information Extraction (IE) and Information Access (IA) systems.

Current research includes summarization, cross language information access systems and building vertical search engines. Information Retrieval and Access in Indian languages is one of the major goals of the lab.

Some major milestones

The SIEL team topped the DUC-2006 and DUC-2007 (Document Understanding Conferences - Summarization contest) in all automatic evaluations, with a significant margin from the runner-up. DUC is organized by NIST, USA, and each year close to forty top research teams from all over the world participate in this contest.

SIEL developed the first cross language search engine WebKhoj for Indian languages.

Speech lab

The long term goal of the speech group is to develop robust speech systems for applications such as speech translation, phonetic engine for Indian languages, speaker recognition for biometrics, and dialog systems in speech mode.

The research focus of the group is to address issues involved in processing speech for phonetic engine, speech synthesis, speaker recognition, speech enhancement, speech coding, information retrieval in speech mode, and multimodal biometrics. The group is also engaged in developing speech systems for Indian languages with emphasis on language modeling, prosody modeling and pronunciation modeling.

Achievements

LTRC has developed a natural sounding text-to-speech (TTS) system for Indian Languages (Telugu & Hindi). The above engine has been integrated into a Reading Software for the Visually Impaired, and released by President of India in March 2003.

Faculty Rajeev Sangal, Dipti M Sharma, Kishore S Prahallad, Soma Paul, Suryakanth V Gangashetty, Vasudeva Verma, Vineet Chaitanya, B Yegnanarayana

Adjunct A Laxmi Bai Lecturer Sriram V

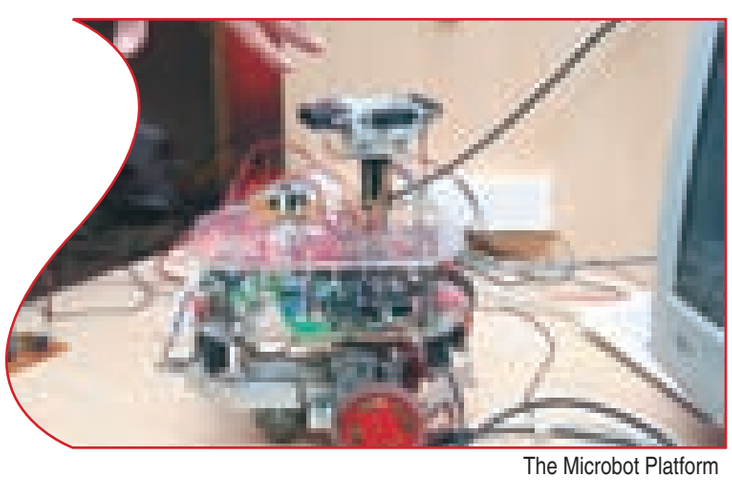
Robotics Research Centre (RRC)

At RRC our focus has been on building robotic systems, making them autonomous through intelligent algorithms and having them perform complex tasks.

Autonomous navigation, rough terrain navigation and systems development have been some of the research themes.

Some of the robots built in house include the SPAWN, Microbot, Johnny-5-like walker and a 3-degrees-of-freedom snake.

Demos by students



The Microbot Platform

Spawn Robot (built in house)

Wireless camera mounted on AmigoBot

The center also conducts robocamp every year where engineering students from across the country create and buiid innovative robots.

Researchers in our center have made original contributions in the areas of fast and active localization for single and multi robotic systems, tracking multiple people and cooperative 3D terrain coverage.

Faculty K. Madhav Krishna, Bipin *Indurkhya, Jayanthi Sivaswamy*