ANNUAL REPORT 2009-2010
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Introduction

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

The Department of Computer Science and Engineering offers educational programs at the undergraduate and postgraduate levels. The M.Tech. program is a second level program in Computer Science and Engineering. The students admitted to this program are selected on the basis of their scores in the GATE examination in Computer Science and Engineering. The focus of the Ph.D. program is on advanced research in Computer Science and Engineering.

The department has 40 faculty members with research interests in all the major areas of computer science and engineering. Some of the research areas are, Algorithms, Compilers, Database Systems, Graphics, Machine Learning, Information Retrieval, Computer Networks, Programming Languages, Embedded Systems and Software Engineering. The department has created a number of specialised laboratories, where both students and faculty carry out advanced research and development activities. Until now, the department has produced more than 30 Ph.D.s in various areas. The faculty and students have published their work in reputed international journals and conferences.

The department has played a major role in the field of Computer Science and Engineering in the country. Faculty members have written a large number of standard textbooks and have participated in producing learning material for various courses in Computer Science and Engineering. The department has a strong interaction with the Industry. Faculty members carry out sponsored projects for government agencies and for the industry. Faculty also act as consultants to the Industry.

The department is committed to promote basic research as well as sponsored research and development, and to train manpower in emerging areas. A list of the research groups and centers in the department are as follows, Centre for Formal Design and Verification of Systems, Centre for Indian Language Technologies, Database and Information Systems Laboratory, Embedded Real-time Systems Laboratory, GCC Resource Centre, Gigabit Networking Laboratory, Graphics and Vision Laboratory, Laboratory for Intelligent Internet Research and Systems and Networks Research Group. The department faculty members collaborate with national and international researchers and industries for research and development activities. Some industries have provided resource for setting up advanced laboratories in the department, and have provided lucrative fellowships for M.Tech. and Ph.D. programs.

The department provides and maintains high-end computing facilities for students and faculty. Several large common computer laboratories are used for supporting classes and M.Tech. and Ph.D. students are provided with individual machines as part of the computing infrastructure. Additionally, several research groups maintain their own computing resources.

The department library, in addition to providing support for instructional assistance, also has copies of software manuals, B.Tech., M. Tech. and Ph. D. dissertations, and Technical Reports produced in the department. The library also collects information about the technical reports available in the sister computer science departments and computer research organizations and industry.
Academic Programmes

<table>
<thead>
<tr>
<th>Degrees Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.Tech          : 37</td>
</tr>
<tr>
<td>M.Tech.         : 85</td>
</tr>
<tr>
<td>Ph.D.           : 3</td>
</tr>
<tr>
<td>Dual Degree     : 17</td>
</tr>
</tbody>
</table>

Fellowship Details

1. Infosys fellowship for Ph.D. students: 4
2. IBM fellowship for Ph.D. students: 1
3. Vijay Vashe and Vincent Fernandez fellowship for M.Tech & DD students
   M.Tech: 2, Dual Degree: 3, Total: 5
4. Microsoft Research India Fellowship for PhD students: 1

R& D Activities

Sponsored Research Projects

<table>
<thead>
<tr>
<th>Sponsored Research Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>New                        : 22</td>
</tr>
<tr>
<td>Ongoing                    : 89</td>
</tr>
<tr>
<td>Completed                  : 8</td>
</tr>
<tr>
<td>Faculty involved           : 32</td>
</tr>
</tbody>
</table>

New Projects

“IITB-CommTel Multi-Service Transport Platform (MSTP) Development” by COMMTEL NETWORKS PVT LTD


“GCC Resource Center” by Department of Information Technology

PERISCOPE: Pragmatic Efficient Reliable Internet working solution using Consumer-Centric Omnipresent Ethernet” by Department of Information Technology

“Understanding Motion: Surface 3D Deformation From Video Data” by Department of Science & Technology

“Advanced Research Lab for Geospatial Information Science and Engineering” by Department of Science & Technology
“GEYSERS: Generalized architecture for dynamic infrastructure services.” by European Commission

“Virtual Machine Placement in Infrastructure Clouds” by INTERNATIONAL BUSINESS MACHINES CORPORATION, Bangalore.

“Microsoft Research India Outstanding Young Faculty Award” by Microsoft Research India Outstanding Faculty Award (under IRCC)

“Logical Methods for Compositional Shape Analysis.” by Microsoft Research Lab India Pvt Ltd.

“Unrestricted Grant for Research Support” by Microsoft Research Lab India Pvt Ltd.

“Microsoft Grant” by Microsoft Research Lab India Pvt Ltd.

“Empowerment of Student & Teachers through Synchronous &asynchronous instruction” by Ministry of Human Resource Development.


“Project OSCAR++, Open Source Course-ware Animation Repository for higher education.” by Ministry of Human Resource Development.

“Creation of Machine translation tools and resources for English to Dravidian Languages” by Ministry of Human Resource Development.

“Type specific QoS based routing in Event Dissemination networks” by SAP Research, Brisbane, Australia.

“StrucFus (Infrastructure for information fusion System)” by Swedish Research Council, Sweden.

“Interference and Affinity Characterization of Vms for Server Consolidation in Infrastructure Clouds.” by YAHOO SOFTWARE DEVELOPMENT INDIA PVT. LTD.

“Yahoo Research Grant.” by YAHOO SOFTWARE DEVELOPMENT INDIA PVT. LTD.

“Large Scale Gene Expression Analysis on High Performance Parallel Computers for Functional Genomics and Systems Biology.” by Department of Science & Technology.

“Indian Language Corpora Initiative.” by Department of Information Technology.

“Second Generation Area Traffic Control System (CoSiCoSt2G).” by Department of Information Technology.

“Real-Time Transit Trip Planner and Route Information System.” by Department of Information Technology.

“India-UK Advance Technology Centre (IU-ATC) of Excellence in Next Generation Networks Systems and Services.” by Department of Information Technology.


“Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-
learning” by Ministry of Human Resource Development.

“Functional site annotation for structural genomics proteins.” by RESEARCH PAPER AWARD SCHEME.

**Completed Projects**

Indo-Us Workshop on Geospatial Information for Developing Countries by Indo-US Science & Technology Forum, New Delhi

aAQUA Mini-Context sensitive information to farmers. By Nokia India Pvt.Ltd.

IBM Faculty Award for Research Work in the area of Automatic Computing by International Business Machines Corporation, USA.

Architectural Information Extraction From Object Oriented Sources by IBM INDIA PVT. LTD. PUNE

Analysis and Design Of Wireless, Mobile and Multiservice Communication Networks by MHRD.

Improving GCC Ports of ABACUS and ANUPAMA by DRDO.


Methodology and Milldeware for Application Integration (M/S.Larsen & Tubro Infotech Ltd.) by Private Organisations.

**Ongoing Projects**


Development of tool for formal verification of VHDL based data and control dominated designs used in safety critical systems by Board Of Research in Nuclear Sciences

Tetherless Human Interface for Simulators (THISS) by Defence Research & Development Organisation

Euro-India ICT Co-Operation by European Commission

Research and Deployment of Next Generation metro Networks ? Roadmap for Carrier Ethernet and 100 Gigabit Ethernet by Agilent Technologies, USA.

Semantic Linkage Between The Web, Intranet And Wikipedia: Discovery And Exploitation in Search And Aggregation by HP Labs.


Research Collaboration on Mobile and Wireless Systems, with Microsoft Research India(MSRI) by Microsoft Research Lab India pvt.Ltd.

Real Time Multiple Sensors To Track Multiple Targets Projected on a Screen by Defence Research & Development Organisation.

Information Aggregation from tables on the Web by Yahoo Inc.

2008 IBM FACULTY AWARD by International Business Machines Corporation.
Analyzing programs manipulating recursive data structures. By Microsoft Research Lab India pvt.Ltd.

Development & Evolution of Sanskrit Word-Net” by Central Institute of Indian Languages.

Rural Connectivity and applications, Wireless Communications and Networking by Tata Teleservie.

Design and development of a real time operating system (RTOS) for safety critical application by BARC.

Extending Framework for WFS-based Interoperability of GIS Sources. By Department of Science & Technology.

Re-Designing the farmer-extension-agricultural research/education continuum in India with ICT-meditated knowledge management. By Indian council of agricultural research.

IBM FACULTY AWARD / Building a self-aware and self-tuning distributed system using queuing theoretic and control theoretic by IBM Corporation.

IBM FACULTY AWARD / lburg based instruction selection in GCC by IBM.

IBM FACULTY AWARD by IBM.

IBM FACULTY AWARD, Integrating Indian Language processing resources and tools and semantic search capabilities with the UIMA by IBM CORPORATION, NEW YORK.

IBM Faculty Award/Approximate search and coverage based verification techniques for flattened circuits with locally specified by IBM Corporation., USA.

Microsoft Award/Soumen Chakrabarti/ Scalable annotation, search & aggregation of semistructured graph and text data models. By Microsoft Corporation.

GALLA – Low Cost Retail Management System by Media Lab Asia.

Microsoft India Distinguished Research Award / Linguistic Data Management of Indian Language Resources. By Microsoft Research India, Bangalore.

Large Scale Application Development and Knowledge Dissemination in Natural Language Processing and Text Mining (HP Labs, Bangalore) by HP Labs, Bangalore.

Setting up a TePP web portal at IIT Bombay by Technology Info. Forecasting & Assesment Council.

INTELLIGENT POWER GRID INITIATIVES IN INDIA by IBM.


Research Support for INAE Young Engineer Awardees by Indian National Academy of Engineering.

CROSS LINGUAL INFORMATION ACCESS (CLIA) SYSTEM by Ministry of Communications & Information Technology.

Development of Indian Language to Indian Language Machine Translation System (IL-IL MT)-Consortium Leader : IIIT Hyderabad by Ministry of Communications & Information Technology.

English to Indian Languages Machine Translation (E-IL-MT)-Consortium Leader – CDAC, PUNE. By Ministry of Communications & Information Technology.

Book on “Data Flow Analysis : Theory and Practice” by Taylor and Francis Group, LLC, USA.
Entity and Relation Types in Web Search: Annotation, Indexing and Scoring Techniques Award Number: 15196 by Microsoft Corporation.

Integrating Entities, Types and Relations into Search: Annotation, Indexing and Scoring Techniques. By International Business Machines Corporation.

Crop disease forecasting services and expert crop advisory to farmers over information kiosk networks. By PAN ASIA ICT(Asian Media for Information & Communication Center, Singapore).

IBM Faculty Award of Prof. S. Sudarshan by IBM Corporate Technology, Ny.


Metamodelling & Architecture by IBM India Pvt.Ltd., Pune.

Formal Verification of Software Systems by Microsoft India (R&D) Pvt.Ltd., Hyderabad

Formal Verification of Large State Transition Systems by General Motors India Pvt.Ltd., Bangalore.

E-Outreach by Technology Info. Forecasting & Assessment Council.

TCS-IIT BOMBAY Laboratory for Intelligent Systems. By Tata Research Development & Design Centre, Pune.

Special Manpower Development Programme for VLSI Design and related Software (SMDP-II) by Department of Electronics.

Building Check-Dams for drinking Water: A Teaching and Research Initiative”.

Ontology Based Framework For Integration of Geographic Information. By DST.

Association For Computing Machinery – Internation collegiate Programming Contest-IBM Canada Ltd. By IBM Canada Ltd.

Time category in Computer Science and Engineering Sept. By DT003 ?

Partial redundancy elimination by Indo-US Collaboration.


Centre for formal design and verification of Software by BRNS.

Network security lab (m/s.nevisnetworks Indi Pvt. Ltd.Pune) by Private Organisation.

Developmental informatics by Private Organisations.

Multimodal Participatory Content Repository for the Education of Rural Children by Private Organisations.

IBM faculty awards-ibm global services India Pvt.Ltd. By Private Organisations.

Financial Assistance for research project entitled “Enabling Web-based workflow over object oriented GIS Models for NRDMS”. By Department of Science & Technology.

Open source software by IBMglobal services India pvt.ltd., Bangalore.
Consultancy Projects

The department undertook 23 jobs generating Rs.1,34,40,508.
The total number of faculty involved was 11.

Extension activities

Conferences

CSE Department organized the 5th International Global Wordnet Conference,
31st Jan- Feb 4, 2010 which was participated in by close to 150 delegates from India and abroad.
International participants included those from Japan, China, Korea, Thailand, Iran, Turkey, Hungary,
Poland, Russia, France, Germany, UK, Sweden and South Africa.

Seminars

Workshops
2009-12-16 : Workshop on Geospatial Information for Developing Countries: Science and Technology, Dec. 16--18, 2009.

The Department of Computer Science & Engineering (CSE), IIT Bombay, and Department of Computer Science, University of Minnesota, USA under the Indo-U.S. Science and Technology Forum (IUSSTF) have planned a 3-day workshop on "Geospatial information for developing countries: Science and Technology" to discuss state-of-art in GIS technologies, understand the challenges in applying them to problems in developing nations, and set future research directions.

2010-02-18 : clouds@iitb: Lecture series on topics in Cloud Computing (6th March, 2010)

Cloud Computing is generating quite a buzz with regards to architecture, design and solutions of distributed systems. Clouds@IITB is a lecture and discussion series on topics related to Cloud Computing. The aim of this event is to understand the hype, issues, research avenues, work-in-progress and instantiated solutions. clouds@iitb is half-day lecture series on topics related to Cloud Computing.

Short-term courses

Continuing Education Programme
The following courses were offered under CEP,

Skill development for post production activity in e learning
Abstractions and pattern oriented design

Courses for coordinators for effective teaching / learning of computer programming

Advanced programming in C++

Effective teaching / learning of computer engineering

Compiler construction with introduction to GCC

Introduction to Robotics

Advanced C++ programming

Introduction to Robotics

Advanced C++ programming

Visitors to the Department

Prof. Rahul Mangharam, University of Pennsylvania. He delivered a lecture on “Networked Cyber Physical Systems and Highlights of Ongoing Work at the Embedded Real-Time Systems Lab at Upenn”

Dr. Ganesh Ramalingam, Microsoft Research India. He delivered a lecture on “Logical Concurrency Control from Sequential Proofs”

Dr. S. Muthukrishnan, Google and Rutgers. He delivered a lecture on “Internet Ad Systems”

Mr. Aditya Phatak, Vice President, Life Sciences Sales, Persistent Systems Inc. He delivered a lecture on “Informatics Solutions for Clinical and Translational Research”

Prof. Shailesh Tipnis, Mathematics Department, Illinois State University. He delivered a lecture on “Anti-directed Hamilton cycles and 2-factors”

Prof. Manik Varma, Researcher at MSRI and Adjunct professor at IIT Delhi. He delivered a lecture on “More Generality in Efficient Multiple Kernel Learning”

Ramakrishna, Red Hat. He delivered a lecture on “10 Things a FOSS Developer Should Know”

Suriya Subramanian, Dept. of Computer Science, University of Texas at Austin. He delivered a lecture on “Dynamic Software Updates: A VM-centric Approach”

Prof. Amit Sheth, Wright State University. He delivered a lecture on “Semantics to Empower Services Science: Using Semantics at Middleware, Web Services and Business Levels”

Balaji Vasan, he delivered a lecture on “Scalable machine learning algorithms: Applications in vision, speech and geostatistics”

Prof. Samarjit Chakraborty, Institute for Real-Time Computer Systems, TU Munich, Germany. He delivered a lecture on “Automata-theoretic Modeling of Streaming Applications”

Dr. Sameera Poduri, University of Southern California. He delivered a lecture on “Mobile Sensing Networks: From Robots to Phones (Faculty Candidate TalK)”
P. P. S. Narayan, Director of Engineering, Yahoo! He delivered a lecture on “Sherpa: a next-generation structured-record distributed storage service”

Shivani Agarwal, Massachusetts Institute of Technology. He delivered a lecture on “Ranking Problems in Machine Learning: Theory and Applications”

Mahesh Ramasubramanian, VFX Supervisor, DreamWorks Animation. He delivered a lecture on “Art and Technology in Animation Film Making A behind the Scenes from the Movie: Monsters vs. Aliens”

Michael Henderson, Director of Technologies, DreamWorks Animation. He delivered a lecture on “Where is the technology in an animation company?”

Dr. Ashish Darbari, University of Southampton in England. He delivered a lecture on “Faculty Candidate Talk - Ashish Darbari SHRUTI: An Industrial Strength Formally Certified SAT Solver.”

Dr. Krishna N. V., IBM Research. He delivered a lecture on “Compiling for Multicore Systems”

Prof. Majd F. Sakr, Carnegie Mellon University, Qatar. He delivered a lecture on “Desert Science - Ongoing research projects at Carnegie Mellon’s Qatar Campus”

Prof. Pascal Fua, EPFL, Lausanne. He delivered a lecture on “Modeling Deformable Surfaces from Single Videos”

Prof. Virendra C. Bhavsar, University of New Brunswick, Canada. He delivered a lecture on “Semantic Matching and Applications”

Prof. Indira Thouvenin, Département des systèmes mécaniques, Université de Technologie de Compiègne, France. He delivered a lecture on “Informed Virtual Environments: Interaction and Knowledge”

Prabhakar Raghavan, Yahoo! Labs. He delivered a lecture on “Heavy tails and models for the Web and social networks”

Rupak Majumdar, Department of Computer Science, University of California, Los Angeles. He delivered a lecture on “What's Decidable for Asynchronous Programs?”

Mr. Benoit Razet, INRIA France. He delivered a lecture on “Effective Eilenberg Machines”

Mr. Mihir Choudhury, Rice University. He delivered a lecture on “Approximate Logic Circuits: Theory and Application”

Prof. Alan Mycroft, University of Cambridge. He delivered a lecture on “Programming Language Design and Analysis Motivated by Hardware Evolution”

Prof. Ryosuke Shibasaki, Center for Spatial Information Science, University of Tokyo. He delivered a lecture on “4D Geospatial Service Infrastructure for Human and Machine Collaboration”

Prof. Sanjay Chawla, School of Information Technologies, University of Sydney. He delivered a lecture on “A Unified Approach for Global and Local Outlier Detection in Large Databases”

Prof. Alan Mycroft, University of Cambridge. He delivered a lecture on “Combined Code Motion and Register Allocation Using the VSDG”

Jayanthkumar Kannan, Intel Labs Berkeley and University of California, Berkeley. He delivered a lecture
on “A Data Capsule Framework For Web Services: Providing Flexible Data Access Control To Users”

Conferences/Symposia/Workshops/Seminars
(Participated/Papers Presented)

National

Diwan, A. A.
Participated in the Homi Bhabha Birth Centenary Workshop on Introduction to Graph and Geometric Algorithms held July 15-18, 2009 at Indian Institute of Science, Bangalore.

Diwan, A.A.
Participated in the Research Promotion Workshop on Introduction to Graph and Geometric Algorithms held Jan. 7-9, 2010 at National Institute of Technology, Trichy.

International

Saketha Nath J

Bhaskaran Raman
3rd ACM Workshop on Networked Systems for Developing Regions (NSDR’09), a workshop in SOSP’09, Big Sky, Montana, USA, 11 Oct 2009.

Sudarshan S

International Conference on Very Large Databases (VLDB), Lyon France, September 2009

International Conference on Management of Data (COMAD), Mysore, Dec 2009

Bhattacharyya, Pushpak
was the organizing chairman of the 5th International Global Wordnet Conference, held at hotel Residence and IIT Bombay, 31st Jan- Feb 4, 2010.

Bhattacharyya, Pushpak
chaired sessions in International Conference on Natural Language Processing held at Hyderabad, December, 2009.

Rajeev Gupta, Krithi Ramamritham, Mukesh Mohania,
Ratio Threshold Queries over Distributed Data Sources, Proc. of IEEE International Conference on Data Engineering (ICDE), March, 2010.

Krithi Ramamritham
Maintaining Coherent Views over Dynamic Distributed Data, International Conference on Distributed Computing and Internet Technologies (ICDCIT 2010), LNCS, Feb 2010 (keynote talk).

Saikat Mukherjee, Srinath Srinivasa, Krithi Ramamritham

Saikat Mukherjee, Srinath Srinivasa, Krithi Ramamritham,

Invited Lectures

National

Ranade A.G.


Saketha Nath J
"Multiple Kernel Learning", AICTE sponsored short-term course at CSE, NIT Surat, Feb'09.

Sharat Chandran

"Digital Heritage Project". NIAS Workshop, Bangalore Jan 8, 2010.


"Filtering: Bilateral and Wavelet-Based", NCVRIPG, Jaipur, Jan 15, 2010.

"Women Ph.Ds in Computer Science". ACM India Launch, Bangalore Jan 21, 2010.

Kameshwari Chebrolu

Bhattacharyya, Pushpak


International

Kameshwari Chebrolu
Solving Developing-World Problems: Academicians' Challenges, CCC Workshop on Computer Science and Global Development, August 1-2, 2009, Claremont Resort and Spa, Berkeley, CA

Bhattacharyya, Pushpak.

"Natural Language Processing at IIT Bombay with focus on Statistical Machine Translation", Xerox European Research Center, Grenoble, France, June 4, 2009.

Significant Awards/Distinctions

S.Sudarshan and Chakrabarti Soumen
“IITB Research Paper Award” for the paper “Keyword searching and browsing in databases using BANKS”.

Sarawagi Sunita
“IITB Research Paper Award” for the paper "Functional sites in protein families uncovered via an objective and automated graph theoretic approach".

Bhattacharya Pushpak.
Examples in the case of Distinctions:

Bhattacharyya, Pushpak.

Phatak D.B.
'Excellence in Teaching' Award for the year 2009.

Krithivasan Ramamritham
Fellow of the Indian Academy of Sciences, Jan 2010.
DASFAA 10+ Best Paper Award for 2010 for DASFAA1995 paper.

Honorary Work

Ranade A.G.
Member of the program committee, European Symposium on Algorithms (ESA) 2009.

Member of panel on scientific computing, Naval Research Board, Govt. of India.

Member of the selection committee, Dept of CSE, IIT Guwahati.

Saketha Nath J
Served as PC-member for PAKDD-2010 (14th Pacific-Asia Conference on Knowledge Discovery and Data Mining).

**Parag Chaudhuri**
Program Committee member for Computer Graphics International Conference 2010 (To be held in Singapore).


Program Committee member for Experience Workshop, Co-organized with the Third International Conference on Pattern Recognition and Machine Intelligence (PReMI'09), December 2009, IIT Delhi.

**Sharat Chandran**
Top Tier Program committee reviewer: WACV, ACCV, CVPR, ICCV, Eurographics

Other Program Committee reviewer: NCC, NCV-PRIP-G

Reviewer of Proposals: DST

**Kameshwari Chebrolu**

TPC member of WISARD 2010

**Sudarshan S**
Vice-Chair of Program Committee, IEEE International Conference on Data Engineering (ICDE) 2010
Associate Editor of ACM Transactions on Database Systems
Associate Editor of IEEE Transactions on Knowledge and Data Engineering

**Diwan, A. A.**

**Faculty Members and Their Specializations**

**Bharat Adsul**
Formal methods in Concurrency, Logics and Games.

**Srinivas Aluru**
Parallel algorithms and applications, bioinformatics and systems biology, combinatorics scientific computing, applied algorithms

**Varsha Apte**
Performance Evaluation of Computer Systems and Networks

**Kavi Arya**
Functional Programming Applications (Domain Specific Languages), Embedded Systems/ Parallel Programming Languages, Distance Learning

**Ashwin Gumaste**
Optical Networks, Telecommunication Networks, Data Centers, Carrier Ethernet
Umesh Bellur  

Pushpak Bhattacharyya  
Natural Language Processing, Machine Learning, Machine Translation, Cross Lingual Information Retrieval

Moreshwar R. Bhujade  
Hardware verification, Neural networks

Supratim Biswas  
Parallel and Distributed Processing, Neural Nets, Architecture

Soumen Chakrabarti  
Hypertext databases, Data mining

Supratik Chakraborty  
Formal techniques for analysis, verification, validation of digital systems, Asynchronous timing analysis.

Parag Chaudhuri  
Computer Graphics

Kameswari Chebrolu  
Wireless Networks

Om P. Damani  
Natural Language Processing

Sharat Chandran  

Dhananjay Madhav Dhamdhere  
Distributed Algorithms, Programming Languages, Operating Systems, Optimizing Compilers

Ajith Diwan  
Graph Theory, Algorithms.

Sridhar Iyer  
Mobile Computing, Distributed Systems, Educational Software.

Saketha Nath J  
Machine Learning, Data Mining, Convex Optimization

Rushikesh K Joshi  
Object Oriented Systems, Distributed Systems, Software Architectures

Shashikant Kelkar  
Software Engineering And Quality Assurance (Testing and Matrices)

Uday Khedkar  
Programming Languages, Compilers, Data Flow Analysis.
Purushottam Kulkarni
Sensor and Wireless Networks, Distributed Systems and Data Dissemination. Developing solutions to problems in above areas for non-urban/rural settings.

Bernard Menezes
Information Appliances, Electronic Commerce, Java Security, Parallel Computing, Time Series Forecasting

Gopalakrishnaswami Nagaraja
Machine Intelligence, Pattern Recognition,

Deepak B Phatak

Krithi Ramamritham
Databases, real-time systems, and distributed applications, Dynamic Data in sensor networks, embedded systems, mobile environments and the web.

Bhaskar Raman
Computer networks, Wireless systems, Communication system design for developing regions

Ganesh Ramakrishnan
Statistical Relational Learning, Graphical Models, Some other topics in Machine Learning such as Support Vector Machines, Information Extraction

Abhiram G Ranade
Algorithms and Combinatorial Optimization

Krishna Shankaran Narayanan
Formal Methods, Bio-inspired Computing

Anirudha Sahoo
Computer networks, Voice routing, QoS in networks, wireless networks, wireless sensor networks, WiMax

Amitabha Sanyal (Head of the Department)
Functional Programming, Compilers, and Programming Languages

Sunita Sarawagi
Data mining: integrating mining with relational DBMS, temporal mining, OLAP: integrating mining with OLAP, indexing multidimensional data, precomputation techniques., E-commerce: mining extensions, Extending relational DBMS, Wide-area distributed database systems

Nandlal L Sarda
Databases, Information Systems, Software Engineering

Sivakumar G
Automated Reasoning, Logic Programming, Rewrite Systems, Networks, Distributed Systems

Milind Sohoni
Combinatorial Optimization, Mathematical Programming, Algorithms

**Sudarshan S**  
Database Systems

**Sundar Vishwanathan**  
Algorithms, Combinatorics, Complexity Theory.

**Publications**  
**Books (Authored)**

**Kelkar, S.A.**  
Strategic IT Management, New Delhi : PHI Learning, 2010

**Bhujade M.R.**  
"Parallel computing," (Revised Edition Dec 2009) New Age science limited UK

**S.Sudarshan**  

**Books (Edited)**

**Chapter (Book)**

**S.Sudarshan**  
Multi-Query Optimization  
Prasan Roy and S. Sudarshan,  

**Articles in Journals**

**National**

**International**

**Vishwanathan S**  
Dhruv Mubayi, Sundar Vishwanathan, Biclique Coverings and the Chromatic Number, Electronic Journal of Combinatorics, Volume 16(1), 2009.

**Parag Chaudhuri**

Kameshwari Chebrolu

Bhaskaran Raman

Diwan, A. A. and Tholiya, N. P.,

Papers Published in Proceedings of Conferences/Symposia

National

Sharat Chandran with Binod Pal
`Sequence based Temporal Segmentation of Cricket Videos," NCVPRIPG, January 2010

Sharat Chandran with Shamsuddin Ladha and Kate Smith-Miles

Sharat Chandran with Aniruddha Joshi
`Hybrid SVM,". Techvista January 2010

International

Pal S and Ranade A.G.

Sriram Kashyap, Rhushabh Goradia, Parag Chaudhuri, Sharat Chandran
Real time ray tracing of point-based models
ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games, February 2010, Washinton DC, USA.

Mustafa Kasap, Parag Chaudhuri, Nadia Magnenat-Thalmann
Fast EMG-data driven skin deformation
Computer Animation and Social Agents (CASA), June 2009, Amsterdam, The Netherlands.

Sharat Chandran with Sriram Kashyap, and Rhushabh Goradia and Parag Chaudhuri

Sharat Chandran with M. Nitya
Sharat Chandran with A. Joshi, Jayramana, V.K, and Kulkarni B.D.


Sharat Chandran with B. Choudhury and P. Hao

Sharat Chandran with Xu, J, Janowczyk A, and Madabhushi, A.
"A weighted mean shift, normalized cuts initialized color gradient based geodesic active contour model applications to histopathology image segmentation". SPIE Medical Imaging. February 2010.

Kameswari Chebrolu and Ashutosh Dekhne,
Esense: Communication through Energy Sensing. ACM Mobicom 2009, Sept 2009, Beijing, China

Kameswari Chebrolu and Bhaskaran Raman,

Ashutosh Dhekne, Nirav Uchat, Bhaskaran Raman
"Implementation and Evaluation of a TDMA MAC for WiFi-based Rural Mesh Networks", 3rd ACM Workshop on Networked Systems for Developing Regions (NSDR'09), a workshop in SOSP'09, Big Sky, Montana, USA, 11 Oct 2009.

Bhaskaran Raman, Kameswari Chebrolu

Rijurekha Sen, Vishal Sevani, Prashima Sharma, Zahir Koradia, Bhaskaran Raman,

Pulkit Gupta, Bharat Jain, Bhaskaran Raman, Purushottam Kulkarni,
"Link-level Measurements of Outdoor 802.11g Links", The 4th IEEE International Workshop on Wireless Mesh Networks (WiMesh 2009), A workshop in SECON 2009, Jun 2009, Rome, Italy.

Debmalya Panigrahi and Bhaskaran Raman,
"TDMA Scheduling in Long-Distance WiFi Networks", The 26th Annual Conference on Computer Communications, IEEE INFOCOM 2009 Mini-Conference, April 2009. [Mini-Conference: top 19.7%-26.6% of INFOCOM 2009 submissions]

Bhanu Pratap Gupta, Devang Vira, S. Sudarshan
“X-Data: Generating Test Data for Killing SQL Mutants” ICDE 2010 (Short paper)

Rose Catherine K. and S. Sudarshan
“Graph Clustering for Keyword Search” COMAD 2009


Saraswati Jaya, Shukla Rajita, Pathade Sonal, Solanki Tina and Bhattacharyya Pushpak, "Challenges in Multilingual Domain-Specific Sense-marking", 5th International Conference on Global Wordnet (GWC2010), Mumbai, Jan, 2010.


