Computer Science and Engineering (CSE) Department, IIT Bombay

Introduction:

The Computer Science and Engineering (CSE) department at the Indian Institute of Technology (IIT) Bombay is the largest among CSE Departments in any institute in India. The research and teaching in the department spans a wide spectrum of areas including algorithms, animation, artificial intelligence, compilers, combinational optimization, computer and medical vision, data mining, embedded systems, formal methods, functional programming, e-commerce, graphics, databases, image processing, machine learning, mobile computing, natural language processing, object oriented systems, parallel and distributed processing, programming languages, reinforcement learning, query processing and optimization, real time systems, security, software engineering, systems, theoretical computer science, wireless and sensor networks and verification. The department has 44 faculty members, including 1 visiting faculty and 1 adjunct faculty, with Prof. Uday Khedkar as the current head.

Student and Faculty Research Achievements (within the last year):

- Abhijit Mishra from CFILT and Ahana Pradhan from Software Architecture group receive IBM Ph.D. Fellowship Award for the year 2015-16
- Prof. Pushpak Bhattacharyya appointed as the Director of IIT Patna
- Abhisekh Sankaran is one of 200 young researchers selected globally to attend the Heidelberg Laureate Forum.
- Prof. S. Sudarshan becomes ACM Fellow
- Prof. Pushpak Bhattacharyya elected Fellow of Indian National Academy of Engineering
- Akshay Gaikwad awarded for his excellence in research
- Aman Madaan, Rohit Gupta awarded for excellence in TA work (Spring’15)
- Prof. Krithi Ramamritham recognized with Outstanding Technical Contributions and Leadership Award by IEEE TCRTS
- Prof. Krithi Ramamritham receives IEEE’s CEDA Outstanding Service Award
- Dr. Pushpak Bhattacharyya appointed president of ACL (Association of Computational Linguistics)
- Two teams from IIT Bombay qualified to be at the ACM ICPC World Finals based on winning performances in the Regional Contest. The team members are Encore: Aditya Akash, Sai Krishna, Shyam J V S
  NTM: Nikhil Vyas, SaiSandeep, Venkat Rao
List of Publications (Papers published in Journal’s)

   Fragmented coloring of proper interval and split graphs Discrete Applied Mathematics 193-1-2015 110-118 A
2. Gitam Shikkenawis, Suman K. Mitra, Ajit Rajwade
   Image denoising using orthogonal locality preserving projections. Journal of Electronic Imaging 24-4-2015 B
4. A. Mathew, P. Gokhale, T. Das and Ashwin Gumaste
5. D. Bhamare, A. Gumaste and M. Krishnamoorthy
   Models and Algorithms for Centralized Control Planes to Optimize Control Traffic Overhead Computer Communications -- 2015
6. Bharat Adsul, Jinesh Machchhar & Milind Sohoni A
7. Sevani, Vishal Raman, Bhaskaran
   HTTPDissect: Detailed Performance Analysis of HTTP Web Browsing Traffic in TDMA Mesh Networks IEEE Transactions on Mobile Computing 0-99-0 2015 0 0 A
8. Gopinath Karmakar, Ashutosh Kabra, Krithi Ramamritham
   Holistic Performance Monitoring of Hybrid Clouds: Complexities and Challenges IEEE Cloud Computing 3-Jan-Feb-2016 72 81 A
10. Meisong Wang, Charith Perera, Prem Prakash Jayaraman, Miranda Zhang, Peter Strazdins, R.K. Shyamasundar, Rajiv Ranjan,
11. NV Narendra Kumar, RK Shyamasundar
12. Choure, Ayush Vishwanathan, Sundar
     On sandpile parameters guaranteeing fast diffusion Electronic Journal of Combinatorics 22-1-2014 1 44 A
13. Chiplunkar, Ashish Vishwanathan, Sundar
     Metrical Service Systems with Multiple Servers Algorithmica 71-1-2014 219 231 A
     Semantic Shape Editing using Deformation Handles ACM Transactions on Graphics (Proc. SIGGRAPH) 34-4-2015 A
15. Garg, R Mehta, M Sohoni, VV Vazirani
   A complementary pivot algorithm for market equilibrium under separable, piecewise-linear concave utilities SIAM Journal on Computing 44 (6), 1820-1847 2015 1820 1847 A
16. R Gokhale, M Sohoni
   Data-driven behavioural characterization of dry-season groundwater-level variation in Maharashtra, India Journal of Earth System Science 124-4- 2015 767 781
17. M. Sohoni
   The University and the Development Agenda Economic and Political Weekly 50-11- 2015
18. R Gokhale, M Sohoni
   Detecting appropriate groundwater-level trends for safe groundwater development CURRENT SCIENCE 108-3- 2015 395
19. Prateek Kapadia, Om P. Damani, Animesh Kumar
   Interference-constrained coverage algorithms in the protocol and SINR models Wireless Networks 21-4- 2015 1391 1409 A
20. Karthik Ramachandra, Mahendra Chavan, Ravindra Guravannavar, and S. Sudarshan
   Program Transformations for Asynchronous and Bached Query Submission, IEEE Trans. on Knowledge and Data Engineering (TKDE) 27-2- 2015 531 544 A
   Data Generation for Testing and Grading SQL Queries VLDB Journal, 24-6- Dec 2015 731 755 A
   Approximate verification of the symbolic dynamics of Markov chains Journal of the ACM 62-1-2 2015 1 34
23. Akshay, S.; Gastin, P.; Mukund, M.; Narayan Kumar, K.
   Checking conformance for time-constrained scenario-based specifications Theoretical Computer Science 594-- 2015 24 43
   Reachability problems for Markov chains Information Processing Letters 115-2- 2015 155 158
   ET4ET: A Large-Scale Faculty Professional Development Program on Effective Integration of Educational Technology Educational Technology & Society 18-3-July 2015 16 28
   Effect of active learning using program visualization in technology-constrained college classrooms Research and Practice in Technology Enhanced Learning 10-5-June 2015 1 19
27. Mishra, S. and Iyer, S.
28. Sankaran, A., Adsul, B. and Chakraborty, S.
   A Generalization of the Los-Tarski Preservation Theorem Annals of Pure and Applied Logic 167-3- 2016 189 210 A
29. Liu W, Awate SP, Anderson JS, Fletcher PT
   A functional networks estimation method of resting-state fMRI using a hierarchical Markov random field NeuroImage -- 2014 520 534 A
   Assessment of MRI-based automated fetal cerebral cortical folding measures in prediction of gestational age in the third trimester American Journal of Neuroradiology (AJNR) -- 2015 1369 1374 A

List of Publications (Papers Published in Conferences)

1. Jonas Harbering, Abhiram Ranade, Marie Schmidt Single track train scheduling MISTA 2015, (Multidisciplinary International Scheduling Conference) 2015 Prague, Czech Republic A Not rated in CORE, Ranking = A on discussion with IEOR faculty
2. Chandrajit Chaudhuri, Yellamraju Tarun, Ajit Rajwade and Subhasis Chaudhuri Low Bit-rate Compression of Video and Light-field Data using Coded Snapshots and Learned Dictionaries IEEE International Workshop on Multimedia Methods in Signal Processing 2015 Xiamen, China A
3. A. Gumaste, S. Bidkar, P. Ghodasara, A. Kushwaha and P. Agrawal Demonstrating a Software Defined Network (SDN) using Carrier Ethernet Switch Routers in a Provider Network Optic Fiber Communications (OFC) conference 2015 Los Angeles A
5. J. Wang, J. Xun, K Lu and A. Gumaste When group-buying meets cloud computing IEEE Infocom 2016 2015 San Francisco A
6. Maity, Mukulika Raman, Bhaskaran Vutukuru, Mythili TCP Download Performance in Dense WiFi Scenarios COMSNETS 2015 Bangalore, India B
17. Abhay Samant, Venkataramana Badarla, Sandeep Yadav, Mythili Vutukuru, Paul Khanna, and Erik Luther Latency and Cost Requirements of Systems for Teaching MAC Protocols NCC 2015 Mumbai
18. Mukulika Maity, Bhaskaran Raman, Mythili Vutukuru TCP Download Performance in Dense WiFi Scenarios COMSNETS 2015 Bangalore
23. Raj Dabre, Fabien Cromiere, Sadao Kurohash and Pushpak Bhattacharyya Leveraging Small Multilingual Corpora for SMT Using Many Pivot Languages NAACL 2015 2015 Denver, Colorado, USA A
25. Aditya Joshi, Vinita Sharma and Pushpak Bhattacharyya, Harnessing Context Incongruity for Sarcasm Detection ACL 2015 2015 Beijing, China A
26. Jayanthy, Jayaprabha S. and Pushpak Bhattacharyya Adjective Intensity and Sentiment Analysis EMNLP 2015 2015 Lisbon, China A
27. Raksha Sharma, Astha Agarwal, Mohit Gupta and Pushpak Bhattacharyya Adjective Intensity and Sentiment Analysis EMNLP 2015 2015 Lisbon, China A
29. NV Narendra Kumar, RK Shyamasundar Dynamic Labelling for Analyzing Security Protocols 22nd ACM Conf. on Computer and Communication Security 2015 Denver, Colorado,12-16 October 2015 A
30. NV Narendra Kumar, RK Shyamasundar Labelled Mobile Ambients Model for Information Flow Security in Distributed Systems 8th Int. Conference on Security in Information Networks (ACM Digital Library) 2015 Sochi, Russia, 8-11 Sept 2015 B
33. Anshu Anand, RK Shyamasundar Scaling Computation on GPUs Using Powerlists HiPC 2015 Bangalore A
34. Chiplunkar, Ashish and Vishwanathan, Sundar Approximating the regular graphic TSP in near linear time FSTTCS 2015 B
35. Yumer, M. E., Chaudhuri S., Hodgins, J. K., Kara, L. B. Semantic Shape Editing using Deformation Handles Proc. SIGGRAPH 2015 A (also listed as journal publication, since it is co-published in the ACM ToG journal)
36. S N Krishna, G Narwane, S Ramesh A Trivedi Compositional modeling and analysis of automotive feature product lines. DAC 2015 USA A
37. S Guha, S. N. Krishna, L. Manasa and A.Trivedi Revisiting Robustness in Priced Timed Games FST&TCS 2015 Bengaluru A
38. S N Krishna, L Manasa and A.Trivedi What’s decidable about recursive hybrid automata HSCC 2015 Seattle A
39. D Bhave, S Jha, S N Krishna, S Schewe and A Trivedi Bounded-rate multi-mode systems based motion planning HSCC 2015 Seattle A
40. S N Krishna, L Manasa and A Trivedi Time-Bounded Reachability Problem for Recursive Timed Automata is Undecidable LATA 2015 Spain C
42. S N Krishna, L Manasa and A Trivedi Reachability Games on Recursive Hybrid Automata. TIME 2015 Germany B
43. Dipak L. Chaudhari and Om P. Damani Introducing Formal Methods via Program Derivation 20th Annual Conference on Innovation and Technology in Computer Science Education, ITiTICSE 2015 A
44. Dipak L. Chaudhari and Om P. Damani Combining Top-down and Bottom-up Techniques in Program Derivation 25th International Symposium on Logic-Based Program Synthesis and Transformation, LOPSTR 2015 A
46. Shreenivas Kunte and Om Damani Population Projection for India – A System Dynamics Approach The 33rd International Conference of the System Dynamics Society, SD. 2015 non CSE conference
47. Prakash, Aditya and Chaudhuri, Parag Comparing Performance of Parallelizing Frameworks for Grid-Based Fluid Simulation on the CPU ACM Compute 2015 Ghaziabad, NCR Delhi, India C
48. Amol Bhangadiya, Bikash Chandra, Biplab Kar, Bharath Radhakrishnan, K V Maheshwara Reddy, Shetal Shah, and S Sudarshan, The XDa-TA System for Automated Grading of SQL Query Assignments (Demo paper), IEEE Int'l Conf. on Data Engineering (ICDE) 2015 Korea A
50. Sudhakar, Nithya and Sharat Chandran Hierarchical summarization for easy video applications. Machine Vision and Applications 2015 Tokyo, Japan A
51. Prasad, Meghshyam Sharat Chandran A Motion Blur Resilient Fiducial for Quadcopter Imaging IEEE Winter Conference on Computer Vision 2015 Hawaii, USA A
52. Prasad, Meghshyam and Sharat Chandran A Motion Blur Resilient Fiducial for Quadcopter Imaging IEEE Winter Conference on Computer Vision 2015 Hawaii, USA A
53. Prasad, Meghshyam and Chakraborty, Abhishek and Chalasani, Raviteja and Sharat Chandran 
Quadcopter-based Stagnant Water Identification NCVPRIP 2015 IIT Patna 
54. Pal, Y. and Iyer, S. Effect of medium of instruction on programming ability acquired through 
screencast Intl Conf on Learning and Teaching in Computing and Engineering (LaTiCE) 2015 
Taipei, Taiwan. 
55. Kadam, K. and Iyer, S. Impact of Blender Based 3D Mental Rotation Ability Training on 
Engineering Drawing Skills IEEE Intl Conf on Advanced Learning Technologies (ICALT) 2015 
Hualien, Taiwan. 
56. Mishra, S. and Iyer, S. Question-Posing Strategies Used by Students for Exploring Data Structures 
ACM Conf on Innovations and Technology in Computer Science Education (ITiCSE) 2015 Vilnius, 
Lituania. 
57. Pal, Y. and Iyer, S. Classroom Versus Screencast for Native Language Learners: Effect of Medium 
of Instruction on Knowledge of Programming ACM Conf on Innovations and Technology in 
Computer Science Education (ITiCSE) 2015 Vilnius, Lituania. 
Workshop in Intl Conf on Computers in Education (ICCE) 2015 Hangzhou, China. 
59. Warriem, J.M. Murthy, S. and Iyer, S. Sustainability at Scale: Evidence-based recommendations 
for Teacher Professional Development Intl Conf on Computers in Education (ICCE) 2015 
Hangzhou, China. 
60. Majumdar, R. and Iyer, S. Beyond Clickers: Tracing Patterns in Students’ Response through iSAT 
Intl Conf on Computers in Education (ICCE) 2015 Hangzhou, China. 
greedy algorithm IEEE Intl Conf on Technology for Education (T4E) 2015 Warangal, India. 
Formulas International Conference on Formal Methods for Computer-Aided Design 2015 Austin, 
USA A 
63. Chakraborty, S., Khasidashvili, Z., Seger, C.-J. H., Gajavelly, R., Haldankar, T., Chhatani, D., Mistry, 
R. Word-level Symbolic Trajectory Evaluation International Conference on Computer-Aided 
Verification 2015 San Francisco, USA A 
64. Chakraborty, S., Fried, D., Meel, K.S., Vardi, M.Y. From Weighted to Unweighted Model Counting 
International Joint Conference on Artifical Intelligence 2015 Buenos Aires, Argentina A 
SAT Witness Generation International Conference on Formal Methods for Construction and 
Analysis of Systems 2015 London, UK A 
66. Pande Sushrut, Biswas Supratim, De Amitava GPU Based Parallel Algorithms for Delaunay Mesh 
Refinement 24th International Meshing Roundtable, Session 7A : Research Notes III : Parallel 
Meshing 2015 October 11-14, 2015, Austin, Texas, USA 
67. Gaikwad AV, Shigwan SJ, Awate SP A statistical model for smooth shapes in Kendall shape space 
Medical Image Computing and Computer Assisted Intervention (MICCAI) 2015 Munich A 
68. Awate SP, Radhakrishnan T Colocalization estimation using graphical modeling and variational 
Bayesian expectation maximization: Towards a parameter-free approach Information Processing 
in Medical Imaging (IPMI) 2015 Scotland A 
69. Muske, Tukaram , Khedker, Uday P. Efficient Elimination of False Positives Using Static Analysis 
International Symposium on Software Reliability Engineering (ISSRE) 2015 A 
70. Kumar, Shrawan, Sanyal, Amitabha, Khedker, Uday P. Value Slice: A New Slicing Concept for 
Scalable Property Checking International Conference on Tools and Algorithms for the 
Construction and Analysis of Systems (TACAS) 2015 A


73. Senthil Nathan, Umesh Bellur, Purushottam Kulkarni Towards a comprehensive performance model of virtual machine live migration. ACM Symposium on Cloud Computing 2015 Hawaii, USA A

74. Nidhi Tiwari, Santonu Sarkar, Maria Indrawan-Santiago, Umesh Bellur Improving Energy Efficiency of IO-Intensive MapReduce Jobs ICDCN 2015 2015 Singapore B