ACM India Annual Event

The ACM Annual Event, in 2017, for the first time witnessed co-location of four of the major activities of ACM India Council. All the events have been jointly organized by the University of Calcutta and Amity University, Kolkata during January 19-21, 2017. The four events were CS Pathsala workshop, iSIGCSE workshop, IRISS 2017 and of course, the ACM Annual Event 2017. Brief reports on each of the program are presented below.

CSPathsala Workshop:

CS Pathsala is an initiative of ACM India in collaboration with TCS. The objective of the workshop on January 19, 2017 had been to build an awareness on the gaps in school level curricula for Computer Science, especially in the context that in some of the schools children start earning Computers from their primary classes. The total number of participants in the half-day workshop was close to 50 and these included Principals and Senior Subject Teachers from about 30 schools in and around Kolkata. The assembly was addressed by Prof. Anupam Basu of IIT, Khragpur, Prof. Madhavan Mukund of Chennai Mathematical Institute and Mr. Vipul Shah of TCS. The half-day workshop was coordinated by Mr. Snehasis Banerjee of TCS.

iSIGCSE Workshop:

The India focused Special Interest Group on Computer Science Education – the iSIGCSE, has been formed to carry out its activities more cohesively. The ground realities of India and its CS higher education pose unique challenges. Initiatives are taken in last year and half to develop a model curriculum considering Indian context. The key next step is to involve our academia into the process. A one-day workshop was organized on January 19, 2017 in the University of Calcutta to focus on a hands-on approach towards an ACM-IEEE CS2013 style curriculum development that is relevant to the Indian context. The one day workshop presented the CS2013 and its India specific issues before lunch by lectures and interactive sessions conducted by Prof. Arati Dixit of SPPU, Prof. Viraj Kumar of PES University, Prof. Abhiram Ranade of IIT Bombay and Dr. Abhijat Vichare of Persistent, Pune. A complete hands-on after lunch was conducted for a few select courses. Participation of nearly 40 teachers from Autonomous Colleges and Universities helped mingling ideas that came out of the ground experience with actual teaching, and the evaluation system followed at different institutions. The hands-on sessions brought out the salient features and advantages of the CS2013 curriculum. The day-long workshop was coordinated by Prof. Madhavan Mukund of CMI, Chennai and Dr. R. Venkatesh of TCS.
IRISS 2017:

IRISS invited Computer Science research scholars in India to showcase their published/accepted work to a conclave of researchers and potential employers. The event hosts oral as well as poster presentations. The submissions went through a program committee and selected papers were invited for oral/poster Presentation.

As the event is co-located with the ACM India Annual Event 2017 where- eminent speakers including Turing Award winners were invited to deliver talks on their work, participants of IRISS got a unique Opportunity to listen to them and interact with them. Besides, a keynote lecture on “Online Scheduling” was delivered in IRISS by Prof. Naveen Garg, Department of Computer Science and Engineering, IIT Delhi. Prof. Garg was awarded Shanti Swaroop Bhatnagar award for his outstanding contributions in research in science and technology. Prof. Neelima Gupta of Delhi University has been the Chairperson for IRISS 2017 Program Committee.

ACM India Annual 2017:
The event (http://kolkata.acm.org/2017/) was held on January 21, 2017 in the Amity University, New Town, Kolkata campus. The symposium was attended by about 450 delegates including the President and other senior officials of ACM from the global head-quarter in US as well as ACM India Council members from distinguished academic institutes and industries.

ACM India Doctoral Dissertation Award (given to the best PhD research in Computer Science) was presented to Dr. Rohit Gurjar (IIT Kanpur) for his Thesis “Derandomizing PIT for ROABP and Isolation Lemma for Special Graphs”. In addition, the day-long program on January 21 included Invited Lectures by the following eminent speakers:

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<tr>
<th>Speaker</th>
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<tr>
<td>Leslie G. Valiant,</td>
<td>Beyond Supervised Learning - Towards Artificial Intelligence</td>
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<tr>
<td>Turing Award winner (2010), Harvard University</td>
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<tr>
<td>Armando Fox</td>
<td>Saving the World One Team Project at a Time</td>
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<td>UC Berkeley</td>
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<td>Jeannette Wing</td>
<td>Crashing Drones and Hijacked Cameras: CyberTrust Meets CyberPhysical</td>
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<td>Microsoft Research</td>
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<td>Deepak B. Phatak</td>
<td>Mainstreaming MOOCs in India – A hybrid approach</td>
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<td>IIT Bombay</td>
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In the 3-day long co-located events had a total of more than 500 participants from Academia and Industry. A large majority of those were budding CS Engineers and PhD scholars from different places of India. The enthusiasm in the participants till the very last lecture on the last clearly marked the success of the events.
P.J. Narayanan, IIIT Hyderabad

The ACM India Research Board (AIRB) has been involving itself in a number of activities including the ACM India Doctoral Dissertation Award, ACM India Survey on PhD Production, MSR-ACM India Academic Research Summit, IARCS-ACM India Student Conference Travel Awards, etc.

ACM India Doctoral Dissertation Award 2017

Abhiram Ranade, IIT Bombay

The ACM India Doctoral Dissertation Award, established in 2011, recognizes the best doctoral dissertation from a degree-awarding institution based in India for each academic year, running from August 1 of one year to July 31 of the following year. The award is accompanied by a prize of INR 200,000, and the winning dissertation is published in the ACM Digital Library. This award is additionally supported by Tata Consultancy Services Limited (TCS), the founding sponsor.

The call for nominations for the 2017 award was sent to more than 100 Indian institutions awarding Ph.D. degrees in Computer Science and related disciplines and was also announced on ACM India's webpage in June 2016. A total of 18 nominations were received from academic institutions from across India.

A jury panel consisting of 9 distinguished computer scientists from around the world was constituted with Prof. Krishnendu Chakrabarty (Duke University) as the Chairperson to review and evaluate the nominations.

The jury was very impressed with the quality of the nominated dissertations. The jury included professors from universities in India, US, and Europe. They went through several rounds of intense deliberations. Initially, based on external reviews and evaluation by the jurors, they shortlisted seven potential winners, and after another round of careful scrutiny, they identified three ‘finalists’. Based on further discussions, they identified the winner and honorable mention.

The jury selected Dr. Rohit Gurjar’s dissertation titled “Derandomizing PIT for ROABP and Isolation Lemma for Special Graphs” for the ACM India Doctoral Dissertation Award, 2017. Dr. Gurjar completed his Ph.D. from Indian Institute of Technology, Kanpur under the guidance of Prof. Manindra Agrawal and Nitin Saxena. Jury also selected Dr. Nagendra Gulur’s dissertation titled “Multi-Core Memory System Design: Developing and Using Analytical Models or Performance Evaluation and Enhancements” for the Honorable Mention. Dr. Gulur completed his PhD from Indian Institute of Science, Bangalore under the guidance of Prof. R. Govindarajan.

The ACM India Doctoral Dissertation Award for 2017 was presented during the ACM India Annual Event on January 21, 2017 at, Amity University, New Town, Kolkata campus. Tata Consultancy Services (TCS) generously sponsored the awards. Both the award winners were present in person to receive the award.

A committee of four members (Abhiram Ranade, Hemangee Kapoor, Supratik Chakravarty and Madhavan Mukund) coordinated the efforts.

ACM Survey on PhD Production in India for Computer Science and Information Technology - 2015 – 2016

Sachin Parkhi and Gautam Shroff, Tata Consultancy Services

The purpose of this study is to collect reasonably reliable data on PhD production in CS in India, and then use it to identify useful trends. This exercise was motivated by the Taulbee report in the US, and Dr Gautam Shroff,
Vice President and Chief Scientist, Tata Consultancy Services has been leading this year’s survey. Based on the inputs and experience from the survey conducted in last couple of years, the survey and report for academic year 2015-16 has been incorporated.

Institutes Included

Last year, the study attempted to include all institutions which have a PhD program in CS/IT. A list of 2507 institutes from all over India was obtained from AICTE. According to the data available on the websites, of these institutes, 73 institutes stated that they have a PhD in CS or IT. We added to these, other institutions (IITs, NITs, etc.) which are known to be granting PhDs in computer science – inputs for this was taken from various researchers and faculty and from the previous study. Additional institutes were obtained from the partner institutes to TCS Research Scholar Program. This gave a total of 145 institutes which claims to have a PhD program and which could be included in this study. This list of institutions is given in Appendix H.

Data Collection

An online form was created, and sent to the Head of Department (CSE/IT) and the Director of the institutes. The form asked for information on: the number of PhD faculty, number of non-PhD faculty, total number of PhD students enrolled and the total number of PhDs graduated last year who got their degree. The form also asked for the stipend that was paid to the PhD students and the major problems that the institutes face with regard to the PhD programme.

Reminders were sent, and the institutions were informed that if they failed to respond, the data of students pursuing PhD from those institutes cannot be captured.

We received responses from 16 institutes through online survey. We assume that the other institutions (i.e. which did not respond and for which we could not find relevant data) don’t have an active PhD program, or if they do, it is too small to be of any significant impact.

For this year’s report, we have grouped the institutions as follows:

- Group 1: Institutions which provided the data about number of faculty, PhDs enrolled, and PhDs awarded. (16)
- Group 2: Institutes which provided data last time but did not do so for this year’s report. (19)
- Group 3: Institutions which did not submit the filled form, but the number of faculty, and the total number of PhDs enrolled was available on their website. (8)
- Group 4: Institutions which did not submit the form and we could not find information about the PhD students enrolled on their websites, but obtained information about the number of faculty. (24)

For group 2, we took the data from last year’s study – assuming that it would not have changed significantly this year.

Analysis

PhD Production

The number of students who completed their PhD from August 2015 to July 2016

Group 1 institutes: 73

Group 2 institutes (estimated): 66

Group 3 institutes (estimated): 44

Group 4 institutes (estimated): 86
To better understand where these PhDs are being produced, we divide the institutions in two categories: those that have 80% or more faculty with PhDs, and others. Presumably the first category represents the more research-focused institutions, while the second category is likely to be the more teaching-focused institutions. There are 37 institutions in the first category (List of these institutions and their data ids given in Appendix E), and 30 institutions in the second category (Appendix F). With this classification, we have the following for PhD production:

- **Research-focused institutes produced a total of 173 PhDs and other institutions produced 96. The total number of PhDs produced last year from all institutions is 269.**

Based on the detailed data provided by Group 1 institutions, we can say:

- **Of the total PhDs produced, 68% were male and 32% were females.**

Looking at the statistics, the number of students who are enrolled:

- Group 1: 881
- Group 2: 691
- Group 3: 430
- Group 4 Estimated: 854

For all the institutes, the total adds up to 2856. And for group 1 and group 2 is 1572. Out of which, the total number of part time students doing PhDs in institutes belonging to Group 1 is 196 and that of Group 2 is 162.

Using this total, we can estimate the number of PhDs likely to be produced in the country in the coming years. We assume that 90% of these students will graduate over the next five years. If we expect that these graduations will be spread across 5 years with approximately uniform distribution, the number of PhDs graduating will come to around 515 per year for the coming five years. Since we know that the enrolment in PhD programs has been increasing over the past few years, we can expect the increase to be gradual. We assume that the increase in first year is x, in 2nd year is 2x… and in 5th year it is 5x. With this, we can estimate that the number of PhDs graduating will gradually increase to about 540 per year in about 5 years among all institutions, and about 310 per year from institutions in group 1 and 2.

**Overall, keeping in mind the likelihood of overestimation for institutions in group 2 and 3, we can say that the PhD production in the Academic Year 2015-16 was around 269, and that PhD production is likely to grow gradually to about 470 per year in about 5 years.**


**MSR-ACM India Academic Research Summit**

Microsoft Research (MSR) and the Association for Computing Machinery (ACM) India co-organized the second edition of the Academic Research Summit in partnership with the department of Computer Science and Automation at the Indian Institute of Science, on January 24th and 25th 2017 in Bangalore. The objective was to share ideas and explore interesting challenges around the theme of ‘Technology for Societal Good’. The summit was a forum to foster meaningful discussion and discussion among the Indian Computer Science research community and drive potential collaborations to address societal challenges in the country with technology.
The agenda included keynotes and plenary talks from distinguished researchers across a variety of areas. There were also tracks focused on specific topics related to the above theme. Speakers/Track participants at the summit included Kalika Bali, Sorav Bansal, Ranjita Bhagwan, Monojit Choudhury, R Govindrajan, Jayant Haritsa, Nutan Limaye, Vani Mandava, Geetha Manjunath, Srujana Merugu, Rashmi Mohan, Madhavan Mukund, P J Narayanan, Venkat Padmanabhan, Raghu Ramakrishnan, Timothy Roscoe, Yogesh Simmhan, Manohar Swaminathan, S Sudarshan, Mukund Thattai, Jaime Teevan, Chandu Thekkath, Jeannette Wing, among others.

The audience at the summit comprised faculty and research scholars from top engineering institutes across the country and representatives from industry and the government. The range of interests and breadth of the technical topics covered hopefully provided a unique experience for the attendees.

IARCS-ACM India Student Conference Travel Awards

Supratik Chakraborty, IIT Bombay

Since 2014, ACM India has collaborated with IARCS for providing travel grants to students from Indian universities and institutions for presenting papers in International Conferences.

We received 575 applications between April 1, 2016 and March 31, 2017. Of these, 48 applications were accepted. The total amount granted was: Rs. 34.7 lakhs, of which 10 grants were for Rs. 1 lakh each, 1 grant was for Rs. 70k, 40 grants were for Rs. 60k each (one of which was declined by the awardee later) and 2 grants were for Rs. 30K each.

Below are a few conferences for which travel grants were awarded in the last financial year (this is not a complete listing)

1. ACM Conference on Programming Language Design and Implementation (PLDI)
2. IEEE International Conference on Computer Communications (InfoCom)
3. AAAI Conference on Artificial Intelligence (AAAI)
4. ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)
5. Annual Meeting of the Association for Computational Linguistics (ACL)
6. International Conference on Software Engineering (ICSE)
7. International Conference on Machine Learning (ICML)
8. Symposium on Theory Of Computing (STOC)
9. International Conference on Automata, Languages and Programming (ICALP)
10. International Conference on Artificial Intelligence and Statistics (AISTATS)
11. International Conference on Robotics and Automation (ICRA)
12. International Conference on Computer Vision and Pattern Recognition (CVPR)
13. International Conference on Autonomous Agents and Multiagent Systems (AAMAS)
14. IEEE International Parallel and Distributed Processing (PDPS.)
15. Pacific-Asia Knowledge Discovery and Data Mining (PAKDD)
17. International Conference on Tools and Algorithms for Construction and Analysis of Systems (TACAS)
18. Design Automation and Test in Europe (DATE)
19. International Conference on Information and Knowledge Management (CIKM)
20. European Symposium on Research in Computer Security (ESORICS)
22. International Symposium on Foundations of Software Engineering (FSE)

The awardees were affiliated to various institutes in the country, including, but not restricted to Indian Institute of Science, various Indian Institutes of Technology, International Institute of Information Technology Hyderabad, Indraprashta Institute of Information Technology Delhi, Chennai Mathematical Institute, Indian Statistical Institute Kolkata, Jadavpur University.

ACM India Education Committee

Venkatesh R, Tata Consultancy Services

During this year the committee continued with the agenda of conducting faculty development programs, evangelizing ACM curriculum, defining and evangelizing a CS curriculum and content for schools, and working towards a national aptitude test for programming.

Faculty Development Program

We organized two FDPs on Algorithms in Delhi and Pune. A total of 50 faculty members from nearby institutes attended these programs. Each of these programs covered those topics of algorithms that the faculty found difficult to teach. The programs also included sessions by Industry practitioners illustrating the application of the concepts in a practical setting. All the slides of the FDPs have been made available, additionally the videos of the Delhi FDP have been uploaded on Youtube. Online feedback was taken from participants of the Chennai and Delhi FDPs several months after the FDP. Most of the respondents felt the FDP helped improve the quality of their teaching and also student performance and feedback. The next step is to find a more scalable model to conduct these FDPs. We will explore working with NPTEL for online FDPs.

National Programming Aptitude Test (NPAT)

The concept of NPAT to test the programming aptitude of students has taken shape. NPTEL has agreed to own the test. It is also supported by NASSCOM, and the website is hosted by Google. A core committee has been formed and three faculty members will be creating the first version of the test. MHRD has been notified and they are supportive of it. A demo site is expected to be ready in June with a launch targeted to coincide with the start of the 2017 recruitment season.

CSPathshala

CSPathshala has had a successful year with the pilot in 15 schools in Pune going off successfully. We hope to have around 60 schools registered for the next round. A more detailed report can be found separately.

Curriculum Development

As part of evangelization of the ACM curriculum we held three workshops in Gandhinagar, Kolkata and Indore. All these workshops were well attended and fairly interactive. We plan to hold at least two more workshops, one each in Chandigarh and Bhopal. We will also be sending a representative, Dr. Abhijat Vichare, to be part of the ACM CC2020 steering committee. CC2020 is a curriculum recommendations effort (see ACM Curricula Recommendations) that seeks to upgrade the previous effort in 2005 (CC2005). The CC2005 offered curricula recommendations for five fields. The current effort is targeted for release in 2020, and seeks to (a) add emerging fields (e.g. cybersecurity), and (b) refine the curricula for relevance into the next decade.
CSpathshala: An ACM India K-12 CS Education Initiative

Vipul Shah, Tata Consultancy Services (v.shah@tcs.com)

Computing is ubiquitous and people from every walk of life will need to be familiar with computing in some form or the other. This will give rise to a huge demand for computing skills leading to a talent shortage unless CS is introduced in schools right now. To address the skills demand created by the industrial revolution, the Sciences and Mathematics were included in the school curriculum in the early 19th century. Now as we participate in the digital revolution, we need to train our children on skills for the digital age. We need to teach our children to be socially responsible citizens and train them to be creators and inventors of technology. It is therefore imperative to teach computing, which promotes problem solving, computational thinking and critical reasoning skills, in schools.

Although teaching computers has already been introduced in schools, the focus is primarily on digital literacy and students are taught use of word processors and presentation applications. Introducing CS curriculum for schools in India has several challenges over and above those faced by the developed nations. Apart from the cultural and regional diversity, India has over 1.6 million schools offering K-12 education to 300 million students. Compare that with about 130,000 schools in the USA with 54 million students. To compound the problem, India has 44 education Boards! The twin problems of filling up the large skills gap in the area of computing and the diversity of the population that needs to be trained quickly makes this a grand challenge. Addressing which will not only improve employability but will also provide industry with the right talent.

The Association for Computing Machinery (ACM) India started a national education initiative, CSpathshala (www.cspathshala.org) in 2016, to teach computing as a science in all schools by the year 2030. The broad strategy identified to achieve the goal was to initially create awareness on why computer science should be taught in schools, shape a modern and robust CS curriculum by bringing together academicians, educators and industry experts, develop detailed teaching aids, provide these for free to teachers through a scalable teacher development and training program and finally empower teachers through vibrant teacher communities enabling sharing of ideas and resources.

CSpathshala as an initiative has made excellent progress in a very short time thanks to its volunteer base and support from Google. Google has pledged support for 2 more years. The highlights of the accomplishments are:

- **Committees**: National advisory and curriculum committees comprising academicians from premier institutes, industry experts and computing teachers.
- **Workshops & training programs**: CSpathshala has conducted 25 workshops and training programs reaching 750+ participants.
- **Teaching aids**: Developing content for 30 lessons/grade for grades 1-8. Content for 20 lessons/grade already uploaded on website learn.cspathshala.org and available to teachers under CC license.
- **Pilot**: Executed a successful pilot in Pune for grades 1-5 with 15 schools, 35 teachers and 5000 students. 75+ schools from Pune, Chennai, Kochi, Kolkata and Goa have signed for 2017-18 pilot for grades 1-8.
- **Volunteers**: 130+ volunteers are helping in developing curriculum, teaching aids, reviewing and curating the teaching aids, conducting teacher training programs and mentoring teachers.
- **Website**: www.cspathshala.org
Sheila Anand/Arati Dixit

The ACM-W India facilitated the following events in the year 2016-17:

1. ACM Celebration of Women in Computing, September 23 - 24, 2016, Goa, India
2. AICWiC 2016 ACM-W India Celebration of Women in Computing 2016, October 6 - 7, 2016, Dehradun, India
3. Grace Hopper Conference India 2016, GHCI 2016, December 7-9, 2016, Bangalore, India
4. ACM-W India session, MSR India Academic Research Summit 2017, January 24-25 2017, Bangalore, India
5. ACM-W One Day Seminar on ‘Role of Women in Professional Life’, February 11, 2017, Charusat University, Charusat, Gujarat, India,

ACM Celebration of Women in Computing, September 2016, Goa

Goa University hosted the First National Level 24 Hour Hackathon for Women organized by ACM-W India and Oracle Academy on the 23rd - 24th September, 2016. The aim of the event was to provide an impetus to women students to take part and display their innovation and coding skills.

The Hackathon was announced on 20th July 2016 and the last date for the registration was 30th August 2016. 71 teams from all over India registered for the event, with each team comprising of 3 members. For the first round, participants had to create innovative projects on the theme “Tech for Public Good”. It was an open platform application development and it was on the participating team’s discretion whether to develop a web application or mobile application or any kind of software on the provided theme. The initial Themes that were provided were waste management, transport, tourism, education, women and child safety, smart city and e-governance. The projects were reviewed by the expert committee and 25 teams were selected for the second round.

The second round was a Skype interview round which was held at centers Nagpur, Pune and Goa(2 Judging Panels) in India. The students were interviewed by an eminent panel of 5 Judges at each center and 11 Teams were selected for the finale to be held on September 23rd – 24th.

The Final round started on 23rd September 2016 at 3.00 pm and continued for the next 24 hours. For the Finale, the theme provided was Educational Technologies. The teams were pre-assigned mentors from the Industry and academia. The mentors were Prof. Ramdas Karmali, Prof Baskar, Venkatesh Prabhu from Goa University and industry experts were Anay Kamat, Prajyot Mainkar, Jervis Pereira, Maxwell Rodrigues, Jason Fernandes, Sangeeta Naik, GITP and Gaurish Abhisheki. At the end of the Hackathon each team was given 5 minutes to present their end product. The winning teams were selected by an eminent panel of judges - Dr. PandurangKamat Chief Innovation and R&D Architect from Persistent Systems, Mr. Milind Anvekar – VP Open Destinations , Mr. Bharat Deshpande, HOD CS BITS Pilani, Mr. Quinton, Mr. Girish Bharne, Center Head Persistent, Mr. Amish Choudhary VP MSCI and Mr. Dileep Menezes ,CEO 3D Systems.
The prizes for the event were sponsored by Oracle Academy. The Winners of the First National Level Hackathon for Women were:

- **First Prize** – Team from CRIT, Vashi. The team members Ananya Satoskar, Sheetal Kadlag and Maitreyi K.V were awarded a trophy and cash prize of Rs.24000/-. 
- **Second Prize** – Team from Sri Manakula Vinayagar Engineering College. The team members M. Hyacintha Maris, A. Nivedha and G. Nivedha were awarded a trophy and cash prize Rs.15000/-. 
- **Third Prize** – Team from Goa College of Engineering. The team members Shweta Salelkar, Shivani Nadkarni and Mugdha Khatakvar were awarded cash prize Rs.12000/-. 

**AICWiC 2016, October 2016**

**ACM-W India Celebration of Women in Computing 2016, Dehradun**

**AICWiC 2016** was celebrated on October 6-7, 2016 at University of Petroleum and Energy Studies, UPES, Dehradun, Uttarakhand, India. It was a unique opportunity of collective learning, interacting with experts and peers and showcasing work-in progress research to an enlightened audience for getting their valuable insights. This two-day celebration had several intellectually enriching opportunities for women students and professionals in the field of computing.

AICWiC’16 had the following highlights:

1. Hands on Coding BootCamp using Python-
2. National level Online Programming Competition (October 6, 2016)
3. ACM-W/iSIGCSE Women Faculty Summit (October 6, 2016)
4. Cultural Program (October 6, 2016)
5. WIP/Poster Presentation (October 7, 2016)
6. DSP technical & other talks and discussions (October 7, 2016)

**Highlight 1**: ACM-W collaborated with “IAmPower – Women In STEM” initiative taken up by IIT Bombay and supported this initiative whole heartedly with about 100 girls participating on October 6, 2016.
Highlight 2: National level Online Programming Competition: About 600 girls had registered across India and final 10 contestants were invited at UPES for the final round that happened on October 6, 2016.

Highlight 3: ACM-W/iSIGCSE Women Faculty Summit( October 6, 2016): 40 Women Faculty members had registered for this Summit. Dr. Arati M. Dixit, Vice-Chair, iSIGCSE(India SIGCSE) gave a brief introduction to various activities being implemented by iSIGCSE. Dr. Margaret Burnett, Distinguished Professor, Oregon State University and DSP delivered a talk on ‘Research Experiences for Undergraduates: Best Practices’. This talk focused on best practices research experiences involving one faculty member and one or a few undergraduate students, who may or may not be connected to a larger team of graduate students. For this context, it described some of the concrete benefits of undergraduate research in computing to both students and faculty mentors. It then guided potential faculty mentors through the three stages of an REU: Before the REU (deciding to get involved and getting started), during the REU (faculty mentor activities and student activities), and after the REU (post-REU assessment and next steps for student researchers).

A panel discussion on ‘Handling Career Breaks Gracefully’ moderated by Dr. Sheila Anand, and members- Dr. Margaret Burnett, Dr. Arati M. Dixit, Dr. Susheela Dhahiya, Dr. Nilima Salankar was enlightening with great participation from audience.
Highlight 4: Cultural Program (October 6, 2016): The UPES cultural team had put up a wonderful and thought provoking program highlighting empowerment of women!
Highlight 5 & 6: DSP technical & other talks and discussions, WIP, Posters (October 7, 2016)

The AICWiC 2016 was inaugurated with traditional lamp lightening by the dignitaries. Dr. Neelu Ahuja, Dean UPES, welcomed all the 200 participants and dignitaries. Dr. Sheila Anand, Chairperson, ACM-W India discussed about ACM-W India initiatives and inspired the audience. Dr. Arati M. Dixit, ACM-W India Executive council Member talked about Women Empowerment. Dr. Margaret Burnett, an ACM DSP delivered a talk on „Is our software gender-inclusive?” In this talk, she explained 5 facets of gender inclusiveness in software and how they tie to a large body of foundational work from computer science, psychology, education, communications, and women’s studies. She also presented emerging work on our GenderMag method, an inspection method that encapsulates these 5 facets into practitioner-ready form. Ms. Divya K Konoor, IBM India gave a talk on “Cloud Openstack”.

The UPES magazine was published by dignitaries during the day. The shortlisted final Ten WIP presentations and ten posters were presented.

AICWiC 2016 Team proudly announced the winners of the events:

Lady Ada National Level Programming Competition:

- 1st Position: Prachi Tekawade, Pimpri Chinchwad Engineering College, Pune, Maharashtra
- 2nd Position: Anamika Modi, Dhirubhai Ambani Institute of Information & Communication Technology, Gandhinagar, Gujarat
GHCI 2016 conference, December 2016, Bangalore.

GHCI 2016 conference, co-presented by ACM along with Anita Borg Institute (ABI) was held from December 7 – 9, 2016 in Bangalore.

LAUNCHED IN 1994, the Grace Hopper Celebration (GHC) is a gathering where women technologists come to learn, connect, and find inspiration. Named for Rear Admiral Grace Hopper, who invented the first compiler for a computer programming language, it is a celebration of women who transform technology. Produced by the Anita Borg Institute, GHC aims to recognize, celebrate, and amplify the women in technical fields whose work impacts lives all around the world.

Grace Hopper Celebration India 2016 was the largest celebration yet, an unforgettable experience filled with amazing opportunities, and exceptional content focused around technology. Women came to network, learn, and find community. Organizations came to learn how to build inclusive cultures and find technical talent. There were about 3000 women participants for the event. ACM India Dr. Madhavan Mukund, spoke at the inauguration ceremony and introduced the gathering with ACM and ACM philosophy. The ACM-W council members Dr. Arati M. Dixit, Rashmi Mohan and Maria Choudhary had organized a mentoring session with the ACM sponsored academic community including students and faculty members. ACM had sponsored 40 members from Academia for GHC 2016.

ACM-W India session, January 2017, Bangalore, India

MSR India Academic Research Summit 2017

ACM-W India session took place during the MSR India Academic Research Summit 2017 on January 24, 2017 at Bangalore, India. An evening of research, academia and youth is a heady mix. On one such balmy Bangalore evening in January, ACM-W India co-hosted an event with Microsoft at the MSR India Research Summit to bring these three elements together - and what a fantastic event it turned out to be. We presented an exclusive session featuring women researchers working on cutting edge problems in Indian academia and industry to an audience of invited attendees comprising of students and career practitioners. Keeping in mind the ever growing need to bring about positive change in the Indian diaspora, we loosely tied to the theme of “Tech for societal good”.

WIP Paper/Poster Presentation

Best Poster: B. Madhushree, Institute of Technology Nirma University, Gujarat
Best Paper: Ranjana Zinjore, North Maharashtra University Jalgaon, Maharashtra
Online Photo Contest: B. Madhushree, Institute of Technology Nirma University, Gujarat
Our evening kicked off with two accomplished researchers talking about their journeys and the impact that they have seen in the field of CS research. Kalika Bali from MSR spoke about her work on NLP and the way to beat stereotypes about women and women researchers. In a funny, tongue in cheek and anecdotal style, Kalika drove home very important points about the biggest myths about women in CS. Ranging from myths around women not taking careers seriously, to shying from shameless self promotion, her thought provoking speech had the audience enraptured.

As president of ACM India, Madhavan Mukund was an ideal candidate to also address our audience that evening. After wisely crediting his wife for his CS PHD he touched upon the ever important point of the lack of role models in CS research and emphasized that those that are around are not celebrated enough. He drove home the point that diversity of all kinds is important for any research - which at its root, needs creativity. Closing out his speech, he called out avenues for doing research for societal good - which in turn, might attract more women who want to make an impact along with doing solid technical work.

To highlight the point about role models, we moved on to the second part of our program - the panel discussion. We brought our accomplished and diverse set of panelists on stage for a 60 minute deep discussion - Jamie Teevan from MSR, Nutan Limaye from IIT Bombay, Srujana Merugu, an independent research consultant at Flipkart and Geetha Manjunath - a researcher turned entrepreneur - made up our stellar ensemble. ACM India secretary, Rashmi Mohan, helped moderate the discussion.

Each of these researchers spoke about the most cutting edge ideas that they were currently pursuing - be it task optimisation, complexity theory, counterfactuals in machine learning - for recommendations - or using the power of data analytics in health care - thereby solving business problems and having an impact on society.

Through a deep tete-a-tete, the panelists touched upon the reasons for why they pursued research, how they arrived at the decision, and what eventually led them down the path they chose. It was incredible to watch the stark differences in the career paths between them, and yet, the commonality between all those stories - a deep self-motivation to achieve something more meaningful in academia or industry.

The theme of the day amongst the speakers was most definitely - COLLABORATION. All of them vehemently agreed that research requires a lot of interaction and collaboration and the myth around it being isolating should be put to rest immediately. This was very inspiring to the young minds present at the event.

As a very pleasant surprise, we were able to gather an audience with a very healthy ratio of men to women. The speakers called out the mix and while thanking the men for considering the diversity discussion to be important enough, they also tasked the men with specific actions. There was an ask of all people in decision making positions (be it men or women) to advocate, sponsor and encourage their women colleagues. What came out strongly was that many problems could be easily resolved if only there was enough awareness of them amongst the community.
As a parting shot, addressing questions from the audience, every panelist tended to agree that the defining moment for them that led them down the path of success was when they recognized their inner confidence and learned to be assertive - not just to promote themselves, but to help others as well. We ended on a positive and high note - with every audience member leaving the event with a specific actionable insight on the topic of women CS researchers in India. We are very grateful to MSR for helping ACM-W facilitate this amazing evening.

ACM-W One Day Seminar on ‘Role of Women in Professional Life'
Charusat University, Charusat, Gujarat, India, February 2017

ACM-W One Day Seminar on ‘Role of Women in Professional Life', Charusat University, Charusat, Gujarat, India, was organized on February 11, 2017. The goal of the seminar was to bring high-potential women to build a foundation of leadership skills that will advance their personal as well as professional goals. Main focus of the seminar was to encourage women to explore their ideas and build professional network. The participants were female faculty members across various departments. The event was convened by Parth Shah and coordinated by Purvi M Prajapati and Sonal P Rami. The main objectives of the seminar were to discuss the following:

- To develop leadership skills
- To build self confidence
- Empowerment of Women in Profession
- Awareness about Women rights in India
- Women’s Law in India

Dr. Arati M. Dixit, ACM-W India Executive Council member, delivered a keynote on ‘Dawn of Women in Computing’. The talk focused on Women in Computing. Women were very much active members of the community contributing to the field of computing since its inception. Women have been involved with the development of historically significant technology which has created the third wave of ‘Information Age’, after the first ‘Agricultural Age’ and second ‘Industrial Age’. The talk also focused to answer few questions like: Have we heard about these women? Who were the major contributors? What have been their major contributions? Are they on the pages of history? How have they carved their names on the pages of history? The talk took into account historical, social, cultural and technological perspectives resulting in an impressive dawn of women in computing.
Dr. Jyotsna Rathod, Director, Former Principal Judge, City Civil & Sessions Courts, Ahmedabad delivered a keynote on ‘Women’s Law in India’. This talk was related to women rights and laws in India. Women policies and laws (Fundamental Rights-Equality before law for women (Article 14)) that help women and girls to achieve their potential throughout their lives – at school, at work, at home and in their community.

Dr. Anuradha Gajjar, Professor, Department of Pharmaceutical Chemistry and Analysis, RPCP, CHARUSAT, Changa conducted a session on ‘Achieving your Leadership Potential’. This talk emphasized on Initiatives and Leadership enabled teamwork development, improving effectiveness at work, ensure that team members share the same goals, encourage competition between ideas, not individuals, allow new people and teams to prove how good they are, reward real merit openly, but never appear to have any favorites/biases.

The distinct outcomes of the Seminar was with respect to awareness of women related to computing field, Turing awards given by ACM, Pioneering women in computer science and highlighted role of women empowerment. Alertness related to women rights and laws in India also emphasized frequent injustices that take place against women & the laws against them. Receptiveness related to excellence in leadership, self-control and teamwork.

**Conference Sponsorships**

**Krishna Nandivada V, IIT Madras**

Several high quality conferences were conducted or are planned to be conducted with ACM sponsorship or cooperation, including:

- VLDB 2016,
- FIRE 2016
- COMSNET 2017
- ICDCN 2017
- IndiaHCI 2016
- ACM Compute 2016
- HIPC 2016
- VLSI 2016
- ICEGOV 2017
- CODS 2017
- AIR 2017
- SIN 2017

**Conferences organized by ACM India and India SIG Chapters**

**ACM Compute 2016**

Compute is ACM India’s flagship conference, held annually in India. This conference was jointly hosted by DAIICT, IIT Gandhinagar, Kadi University and Gujarat University, with support from the ACM India Gandhinagar chapter. The theme of the conference was “Internet of Things”.

**Papers Submitted:** This year we received an enthusiastic response with 115 papers of which we selected 22 papers (13 full papers, 5 poster papers and 4 short papers).
**Keynote Speakers:** We had 3 keynote speakers speaking on the conference themes:

- Dr. Shivkumar Kalyanaraman, Program Director, Special Initiatives, IBM Research - India

  Spoke on: "The Energy-Transportation Nexus & the Emergence of Cognitive IOT Systems."

- Prof. Krithi Ramamritham, Head, Centre for Urban Science and Engineering, IIT Bombay

  Spoke on: "Managing Energy, Computationally."

- Dr. Rajeev Shorey, Principal Scientist, TCS Innovation Lab, Cincinnati, USA and Bangalore

  Spoke on:: "Internet of Things: Technology, Applications, Services and Research Directions"

**Tutorials:** Three half-day tutorials were conducted at DA-IICT, Gujarat University and at Kadi Univ as below:

1. DA-IICT: “Introduction to IoT”, Umesh Puranik, Principal Architect, Persistent Systems
2. Gujarat Univ.: “Information Retrieval”, S. Krishnan and K Sankaranarayanan, IBM Research

**Panel Discussion:** “IoT for India: Opportunities and Challenges"

**Moderator:** Venkat Padmanabhan, Microsoft Res (ACM fellow, recipient of Bhatnagar award, 2016

**Panelists:** focused their discussion on "concrete" work opportunities specifically in the Indian context.

Zainul Charbiwala, Co-Founder & CTO, Tricog Health, working on remote heart monitoring

Prasad Pillai, Co-Founder & CEO, Raksha SafeDrive, sensors for improving road safety

Yogesh Simmhan, Assistant Professor, IISc, IoT deployments on campus and big data processing

Amarjeet Singh, Co-Founder & CTO, Zenatix, IoT for energy management in smart buildings

Ganesh Suryanarayanan, General Manager for Consumer IoT at the Tata Group

**iKDD CODS 2017**

The Fourth Annual Conference on Data Science (CoDS) organized by IKDD was held from March 9th to 11th at IIT Madras, Chennai. As with the last year the conference was co-located with the CSI SIGDATA Conference on Management of Data (COMAD), which ran from March 8th to 10th, with the events on 9th and 10th common to the two conferences. As with the previous year the conference drew a combined participation of more than 250 registered attendees. We had a highly rigorous review process and selected only 6 papers to be presented at the main conference, while several papers that did not quite make the cut were invited to be presented as posters.

The highlight of the conference was a high-quality invited speaker list - Lise Getoor from UC Santa Cruz, Srinivasan Parthasarathy from Ohio State, Soumen Chakrabarti from IIT Bombay, Sriram Raghavan from IBM, and Ruslan Salakhutdinov from CMU (via Skype). As in the past we had active participation from the Indian industry, with several papers presented in the industry track.

The data challenge on language identification in mixed textual data drew many good responses. The organizers had to declare joint winners for the prizes, since there were many good entries. We also continued our premier paper track with 6 papers from top data science conferences being presented by their authors at CoDS.

For the first time this year we conducted a graduate research workshop, with sessions on technical writing and data visualization, apart from a poster session where participants presented summaries of their research work. The workshop was highly appreciated by the participants, and it was widely believed that the quality of the posters presented were very high.
Given the close synergy between the two conferences, it was decided that henceforth the two shall be organized as a joint conference and the first edition of the CoDS-COMAD joint conference will be from 11th to 13th January 2018, in Goa.

ISOFT Report for 2016-17

The marquee event conducted by ISOFT (isoft.acm.org) was the conference ISEC 2017, INNOVATIONS IN SOFTWARE ENGINEERING CONFERENCE (formerly India Software Engineering Conference) 5-7 February 2017, held at Jaipur India. Key Highlights of the conference below:

• ISEC 2017 received 83 (after desk-rejects) paper submission from authors of 11 different countries
• Research track accepted 27% (16/59) of the papers
• Industry track accepted 39% (6/12) of the papers
• Mobile software engineering track accepted 33% (2/6) of the papers
• Overall across 3 tracks 30% of the papers were accepted.
• A total of 25 papers are presented at ISEC 2016
• 19 Regular (25 Minutes) and 6 Short Papers (15 Minutes) were presented.
• Every paper reviewed by 3 PC Members followed by an online discussion between reviewer and program chairs
• We had two Keynotes
  • Sebastian Uchitel (University of Buenos Aires) on Runtime Controller Synthesis for Self-Adaptation: Discretion Required
  • Henderik A. Proper (Luxembourg Institute of Science and Technology) on Organizational Design & Enterprise Engineering – Two sides of the same coin?
• Invited Talks - ICSE 2016 distinguished papers
  • FSE 2016 Distinguished Paper: Preference Inconsistencies Ahead
• Invited Talks - ICSE 2016 Distinguished Paper:
  • Efficient Large-Scale Trace Checking Using MapReduce
• Four workshops were conducted as part of ISEC 2017
  • Modelling Symposium (ModSym)
  • Development aspects of Intelligent Adaptive Systems (DIAS)
  • Software Engineering Education Workshop
  • Educational Data Mining Practices in Indian Academia
• Five Tutorials were conducted as part of ISEC 2017
  • Work System Theory and Work System Method
  • Conducting Systematic Literature Reviews
  • Standards Driven Software Testing Best Practice
  • Software Quality Predictive Modeling
  • Engineering Smart Physical- Cyber-Social Systems
• About 200 attendees attended the conference.

Workshops/Events

Chapter Summit

On the last day of Compute 2016, Chapter Summit was held. Representatives from 26 Professional and Student Chapters attended the summit. Shekhar Sahasrabudhe, COO ACM India and Sheila Anand ACM-W India Chair, addressed the representatives about different activities that Chapters can organize. They advised chapters to take advantage of DSP and ESP schemes to get quality speakers for their activities. They briefed about different initiatives of ACM India and opportunities available for chapters to come forward and participate in these initiatives. Each chapter was given an opportunity to present the activities organized by them and the future plans.
Lectures under DSP/ESP schemes

We have 12 lectures under Distinguished speaker Program and 22 lectures under Eminent Speaker Program during the year.

### Membership

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