

**Report to the IEEE Control Systems Society Outreach Program
Fourth Indian Control Conference, Kanpur, January 4 – 6, 2018
Submitted by
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Introduction

The Fourth Indian Control Conference (ICC) was held during January 4 – 6, 2018 on the campus of the Indian Institute of Technology, Kanpur (IITK) (Fig. 1). The first ICC was held during January 5 – 7, 2015 on the campus of the Indian Institute of Technology, Madras. The second ICC was held during January 4 – 6, 2016 on the campus of the Mahindra Ecole Centrale in Hyderabad. The third ICC was held during January 4 - 6, 2017 on the campus of Indian Institute of Technology, Guwahati. The fifth ICC will be held on the campus of the Indian Institute of Technology, Delhi during January 9 – 11, 2019. The Outreach Program of the IEEE Control Systems Society made a generous award of \$6,000 to support student participation in the Fourth ICC. This report gives details of how the funds were utilized.



Figure 1: Venue of ICC 2018 -- the Outreach Center of IIT Kanpur.

Technical Co-Sponsorship and Proceedings Acquisition

The Fourth ICC received both technical co-sponsorship and proceedings acquisition from the IEEE CSS. Thus, for the third time, the Proceedings became a part of IEEE Xplore. Aspiring authors had to submit full papers, and reviewing of papers was handled through Papercept. Strict standards were enforced, and a total of 64 papers were accepted (out of 123 submissions) for oral presentation and for inclusion in the Proceedings (and IEEE Xplore).



Figure 2: Dr. Ali Jadbabaie giving his plenary talk.

Sponsorships

The Fourth ICC received Gold Sponsorships from Mathworks and Honeywell, and Silver Sponsorship from Quanser. Apart from these private sponsors, ICC 2018 also enjoyed financial support from several agencies of the Government of India, including Board of Research in Nuclear Sciences, Technical Education Quality Improvement Program, Indian Space Research Organization, Council for Scientific and Industrial Research, Science and Engineering Research Board, and IITK's Center for Development of Technical Education. Additionally, IITK supported the conference in kind.



Figure 3: Dr. Rajesh Rajamani giving his plenary talk.

Technical Program

The first day of the conference was dedicated to tutorials. In the morning there were two tutorials in parallel tracks. The first tutorial was by Mr. Dharendra Singh of Mathworks titled *Design & Deploy Control Algorithms for Robotics Application Using MATLAB*. The second tutorial of the morning session was by Dr. Pavithra Prabhakar of Kansas State University on *Formal Analysis of Hybrid Control Systems*. The afternoon session had two tutorials in parallel tracks. The first tutorial of this session was by Mr. Amit Doshi and Mr. Rahul Choudhary of Mathworks on *Predictive maintenance to forecast potential failures* while the second tutorial was by Dr. Prasanth LA of Indian Institute of Technology Madras titled *Simultaneous Perturbation Methods for Simulation Optimization*. The next two days were devoted to plenary talks and oral presentations of accepted papers. There were three plenary speakers, namely: Dr. Ali Jadbabaie (Fig. 2) of Massachusetts Institute of Technology, Dr. Rajesh Rajamani (Fig. 3) of University of Minnesota, and Dr. Girish Deodhare (Fig. 4) of Aeronautical Development Agency. The program also featured two plenary sessions by Industry participants, namely, Mr. Naga Pemmaraju of Mathworks and Mr. Jagadeesh Brahmajosyula of Honeywell. A keynote talk was delivered by Dr. Vijay Mishra of Indian Institute of Science Bangalore.



Figure 4: Dr. Girish Deodhare giving his plenary talk.

Best Student Paper Prize

The conference featured a Best Student Paper Prize, the winner of which was chosen from four finalists. The award ceremony preceded the banquet. The four finalists were Mayank Baranwal of UIUC, Abdalla Swikir of TU, Munich, Hadhiq Khan of NIT Srinagar, and Mathew Abraham of IIT Bombay. Mr. Mathew Abraham was selected as the overall winner (Fig. 6).

Student Support Program

In continuation with previous years' policies, the students chosen to receive support were required to pay the full student registration fee of Indian Rupees (INR) 5,500, or roughly USD 85, and then get reimbursed. The ceiling on reimbursable travel fare was kept at INR 7000 per student (being supported under the student support scheme). Those who spent less than INR 7000 were reimbursed the actual amount. INR 7000 is about USD 109.



Figure 5: Presentations in regular sessions



Figure 6: Mathew Abraham receiving the Best Student Paper Award from the Program Chair of ICC 2018, Dr. Ramprasad Potluri

Other key features of ICC 2018:

All student authors shortlisted for the support were supported for registration, travel and accommodation during the conference. There were no no-shows from the supported students. Unless they were authors, the applicants who had received student support in the last two years for the past ICCs were denied student support this time.

Participation

ICC 2018 was attended by 107 participants, comprising 64 students, 26 academic professionals, and 17 non-academic professionals. Out of the 64 student participants, 33 were supported through the Outreach Program of the CSS, for which the organizers are enormously grateful. A total of 31 student participants were enrolled in Ph.D. programs in India. Of these 31 supported participants, 19 were authors. Authors from IITs and non-IITs were 6 and 15 in number, respectively. Due to the establishment of the new tax regime, the student support application and registration was opened late. This probably led to the reduction in the number of students supported in the fourth version of the ICC. However, with the lessons learnt from this experience, the modalities for student support for the ICC 2019 will be finalized so as to encourage more applicants.

Statistics:

Budget:

The grant of USD 6,000 from the CSS Outreach Fund got converted to INR 3,92,670. Out of this, an amount of INR 60,000 was kept in reserve to pay the Goods & Services Tax (GST) introduced in 2017 by the Government of India, leaving a disposable balance of INR 332670. The registrations and travel support amounted to INR 269,943, and accommodation amounted to INR 23,000. Therefore, the total expense against the Student Support Programme was INR 292,943, leaving a surplus of INR 39,727, i.e. approximately USD 590. We will know after July 31, 2018 how much GST we would have to pay, if any. If the entire amount is deemed to be liable to GST, then the balance would INR 39,727 as stated above. The Chair of the Outreach Program will be kept informed of the outcome.



Figure 7: The organizers and some participants with Dr. Rajesh Rajamani.

Lessons Learnt:

With the experience of ICCs from 2015, 2016 and 2017, things went smoothly in the conference of 2018. The procedure of requiring students selected to receive support to pay the registration up-front and get reimbursed at the conference achieved the desired objective of eliminating no-shows. The one-time perturbation caused by the introduction of the GST regime took some time to sort out, but the procedure to be followed in future is now clear. The Fifth ICC will be held in New Delhi, which is well-linked with road and rail service. Almost all students will be paid

rail/road fare. In addition to support from CSS Outreach fund, we would seek to find additional sources. We received considerable support from the Government of India for the Fourth ICC, and we might not be so fortunate next year. However, industrial sponsorship seems to be steady, so the ICC as an annual event is now on a solid footing.

Conclusion:

The organizers (Fig. 7) are enormously grateful to the CSS Outreach Fund for the generous support of USD 6,000, which facilitated the participation of 33 students. Having so many students in attendance gave a very youthful and energetic air to the Fourth ICC. We expect to be able to support many more students in the Fifth ICC during January 2019, now that the hiccups due to the introduction of the GST regime are sorted out.