Editorial

SI: ICAARS - March 2016

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The Editorial Board in its last meeting decided to make three experiments to popularize CSI Transactions on ICT and to increase the number of channels that can act as potential source of contents for each issue. The *first one* was to bring out special issues based on conferences held in India. The *second one* was to align with an advanced program of Government of India and bring out special issues based on the research outcome reported in those programs. The *third one* was to have special issues dedicated to a subject matter of current interest. The rationale for this decision to experiment was to institutionalize the wonderful work done in India that normally goes unnoticed. Besides, as CSI Transactions on ICT is from a professional society, the Editorial Board felt that such an approach by a journal would foster industry academia collaboration significantly.

Operationalizing the three ideas and actually conducting these experiments became a challenge! India, as the readers are aware has quite a few educational institutions that carry out high end and high quality research, ranging from basic to applied sciences, engineering, and technology. Computer Science and ICT being an all-encompassing discipline, selecting conferences and maintaining focus in each issue and across issues were seen as an operational challenge. We decided to look at representative conferences in 2016 and selected one each from south, north and east. We also insisted that the organizers of these conferences present to us the best, as evaluated by them. We identified three conferences; ICAARS from south, REDSET from north and ICAC from east. While ICAARS had modest

number of papers, ICAC had an impressive number, and REDSET had the maximum. We scheduled ICAARS as the March 2016 issue, along with one paper selected from general pool of submissions. We scheduled REDSET across three issues June, September, and December of 2016, as REDSET had an impressive number of papers to be carried. We decided to make it a combined issue to keep the REDSET papers together. Along the same lines, we scheduled ICAC as March 2017 issue.

The second part of the experiment was to align with a Government program, which is directly related to our journal CSI Transactions on ICT. Sir Visveswaraya PhD program, in which the Government of India gives out over 1000 Ph.D. Fellowships, turned out to be an ideal fit. The Ministry of Electronics and Information Technology (MEIT) was also keen to collaborate. Since the program has a self-designed three stage filter for selecting publishable material, it naturally crated a win-win situation for the program as well as the journal. The first batch of papers is scheduled as June 2017 issue.

Having explained to the reader the rationale and modus operandi of selecting papers for our journal based on a three-pronged approach suggested by the Editorial Board, I would like to write a few paragraphs about the work reported in the current issue; viz., March 2016 issue of CSI Transactions of ICT focusing on the Special Issue—ICAARS.

ICAARS stands for International Conference on Advanced Automation, Robotics, and Sensors, held in PSG College of Technology, Coimbatore, India in 2016. Robotics and Automation is the key technology of the future, with application potential across a wide spectrum—from strategic areas such as aerospace, defense and atomic energy to services such as hospitality and healthcare. It

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holds the potential to transform the future of manufacturing.

The development of robots into intelligent machines touches upon issues such as self-understanding of humans, socio-economic, legal and ethical issues. Robotics is an area where several sciences meet. Many developments in sensors, vision systems, virtual systems, adaptive control systems, precision machining and material handling have contributed to the advancements in the field of Robotics and Industrial Automation. The papers selected for publication in this issue reflect the spirit of Robotics, Automation, and Sensors.

1. *Bhagya R. Navada and K. V. Santosh of Manipal Institute of Technology, Manipal*, addresses the challenge of enhancing the linear range of a thermistor over full scale, (by overcoming the saturation effect existing in available sensors) and design a multi sensor data fusion (MSDF) framework using thermocouple as another temperature sensor along with the thermistor. Output derived from *thermistor and thermocouple* is converted to a common representation format using min–max normalization technique. Data association and decision making of the fused data is carried out using fuzzy toolbox. MSDF technique once trained and tested for its functionality, yields an improvement in the linearity for the extended range of thermistor and shows a root mean square of percentage error around 2.49% as well.
2. Master–slave manipulator is required in hot cell area of nuclear power plants for efficient handling of irradiated materials. For handling the manipulator, the operator needs to see the hot cell environment. Through a lead glass or camera, operator sees the environment and takes the control of manipulator. *Jobby C. Johnson, Saji Jacob George, and S. Murugan of Indra Gandhi Center for Atomic Research, Kalpakkam, India*, propose to enhance the area of visibility and to have a better feel of hot cell environment, and discuss the design of a laboratory scale model of a head mount device (HMD) which senses the head actions using micro electro mechanical systems sensors and the sensor information is transmitted to the remote field to replicate the action. A camera-mounted mechanism was developed as the remote device for this purpose. The video signal from the camera was fed back to the HMD for remote vision.
3. In master slave manipulator, an operator, in order to manipulate the objects in remote environment using an iso-kinematic master arm, which is located in the control room, controls the slave arm. In such a scenario, where the actual work environment is separated from the operator, formulation of techniques for assisting the operator to execute constrained motion (preferential inclusion or preferential exclusion of workspace zones) in the slave environment are not only helpful, but also essential. *Surendra Singh Saini, Ushnish Sarkar, Teja Swarup Tumapala, Sreejith Panjikkal, and Debashish Datta Ray of Bhabha Atomic Research Center, Mumbai*, propose a user friendly method for image based acquisition of the constraint geometries, thus eliminating the need for in-cell measurements. After surveying various hot cell tasks and the associated geometrical primitives, the authors have developed an algorithm for generating the constraint geometry for each primitive.
4. The increase in speed and accuracy of computation methods and the advancement in sensor technologies have shifted the focus towards health monitoring systems of vehicles. An adaptive control system called battery management system is needed to ensure the safety and life optimization of batteries in electric vehicles. *Shobana P. R. and Ramesha K. of CSIR Madras Complex* propose a novel algorithm based on dynamic resistance mapping and develop a data driven computational model for estimating the health of battery and achieve a correlation co-efficient of 99.45% during run time.
5. DC Motors are widely used in robotics, automotive sectors and consumer electronics. Conventional motor drivers use a configuration called the H-bridge, which consists of four switching devices that help control the speed, and direction of the motor. Increasing the number of switching devices not only increases the complexity of the circuit but also increases the cost of the overall system. *Nishant Shrivastava and Nambiar Rohitkrishna of MIT College of Engineering, Pune* suggest a novel method of bi-directional control of a DC motor using only one MOSFET and two relays. The speed as well as the direction of the DC Motor can be controlled along with braking, as per their claim.
6. *Sooraj Krishna, E. S. Rahul, and Rao R. Bhavani of Amirtha Viswa Vidyapeetam, Amirthapuri*, discusses their design and implementation of a new localization method for the industrial robot environments using RFID technology. The entire system is implemented as a Robot Operating System (ROS) based package to facilitate integration and experimentation in broad range of robot architectures. The authors further claim that the system along with real time 3D visualization of the monitored work environment, provides good real time response and is scalable a method for human localization in robot-cells.

I am sure that readers find this issue extremely interesting.

Enjoy reading!