
Editorial

Mohammad Ayoub Khan

School of Engineering and Technology,
Sharda University,
Plot No. 32-34, KP III, Gr. Noida, UP. 201306, India
E-mail: ayoub@ieee.org

Biographical notes: Mohammad Ayoub Khan received his PhD in Electrical Engineering from Jamia Millia Islamia (A Central University), India. He works in a multi-disciplinary environment involving frequency identification, microcircuit design, NFC, VLSI (electronic design automation, optimisation and timing analysis), placement and routing in network-on-chip, etc. and applied to various real world problems. He has published over 60 publications, two patents and given more than ten plenary lectures and conference tutorials in these areas. Currently, he works with the Sharda University, a leading educational institution in India. He serves the editorial board of over ten international journals and has also guest edited five special issues on various topics.

We are delighted to welcome you to the first issue of *International Journal of Circuits and Architecture Design (IJCAD)*. *IJCAD* is a peer-reviewed international journal with a key objective of providing the academic and industrial communities with a medium that presents original cutting edge research related to the role of circuits, architecture design in electronic design automation.

Rapid developments and convergence in consumer electronics have made the theory of VLSI circuits a burgeoning area of research and development. The *International Journal of Circuits and Architecture Design (IJCAD)* proposes and fosters discussion on circuits, architecture design, systems, processor architecture and electronic design automation.

The journal provides a platform for research scholars, scientists and academicians worldwide to promote share and discuss the various new issues and developments in different areas of circuits, architecture and design.

The objectives of the journal are to disseminate new knowledge and technology among the academic and research communities, professionals and industry practitioners, thus bridging the gap between research theories and actual implementation. The journal represents a current, comprehensive and practical information tool in the area of circuit and architecture design.

IJCAD intends to publish original and unpublished work that describes current research in circuits and architecture design on both the theoretical, methodological and fabrication aspects, as well as applications. *IJCAD* is published quarterly (four issues every year). *IJCAD* publishes two types of articles: regular papers and brief (short) papers.

Regular papers describe recent fundamental contributions in the field of circuits and architecture design. Brief papers are targeted for the rapid publication of special short communications. Each manuscript is thoroughly reviewed by three or more independent

reviewers. The journal policy is to notify the authors with the review result within 90 days of receipt of their papers.

We received several paper submissions, which were all peer-reviewed by 20 professional reviewers. Finally, six submissions were accepted for publication in inaugural issue.

The first paper titled ‘Low power 8051-MISA-based remote execution unit architecture for IoT and RFID applications’ presents SIMD architecture for RFID applications. Authors have proposed a novel REU architecture using a minimal instruction set architecture (MISA) based on 8051

The second paper titled ‘Design techniques for variability mitigation’ presents discussion on the fabrication technology and the migration towards the nanometre scale, 22 nm and beyond. Authors have shown that yield enhancement at 22 nm has become one of the challenges facing the integrated circuits design community. Authors have classified and presented various approaches to mitigate the PVT variations on the circuit and architectural levels.

The third article titled ‘A programmable multi-step cyclic Vernier time-to-digital converter’ presents a novel new architecture for a time-to-digital converter (TDC). The proposed TDC has programmable architecture that allows the reusability of the design for various applications requiring different resolution, throughput, area and power constraints. Authors have demonstrated the prototype using the TSMC 65 nm technology. Also, the detailed transistor level design along with the system level analysis has been presented.

The fourth article titled ‘Elimination of output gating performance overhead for critical paths in scan test’ presents output gating technique for circuit.

Authors have emphasised that excessive switching activity in test mode results in higher power dissipation than normal mode of operation and becoming a serious issue. The scanning of test vectors in test mode causes unnecessary switching in combinational block. To reduce the switching authors have proposed gating methods. In this work, authors have proposed a modified transistor level design of a scan flip-flop for critical paths, which eliminates the unnecessary switching in combinational circuit during shift phase of a scan-based test.

The fifth article titled ‘Adaptive AI-based two-stage control for an induction machine drive’ proposes a control strategy for speed control of an induction machine drive. Authors have implemented AI-based adaptive neuro fuzzy controller to act on both slip frequency and current magnitude.

The sixth article titled ‘A comprehensive comparison between LE and LM-based methodologies for optimisation of digital circuits’ presents a very interesting area of circuit optimisation using comparison between Levenberg-Marquardt (LM) and logical effort (LE) theory. Authors have used SPICE simulations for comparing the two methodologies in an 180 nm 1.8 V CMOS technology.

We would like to take this opportunity to thank all the people who have helped in launching this new journal. We are also grateful to all our editorial board members who provided us with a lot of support and advice, and who will continue to support us in the coming years. All of them are established researchers in their field and we are sure that their international reputation and great expertise in the field of circuit, architecture and design will have a significant contribution in shaping up *IJCAD* as a reputed international journal.

We are honoured and fortunate to work with a strong technical editorial team of Inderscience Enterprise Ltd.

Our special thanks go to all the authors who have contributed papers to the inaugural issues of *IJCAD*. We hope to build *IJCAD* so that it becomes a central forum for the circuits and architecture design community and one of the main media for presenting original research ideas. We encourage researchers from all disciplines and specialties to submit their papers, as well as reviews, and letters to the editor.

Thanks again for all your encouragement and support. We look forward to working with you.