

Lecture Notes in Electrical Engineering 1046

Dilip Kumar Sarkar
Pradip Kumar Sadhu
Sunandan Bhunia
Jagannath Samanta
Suman Paul *Editors*

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Preface

The 4th International Conference on Communication, Devices and Computing (ICCDC 2023) was held at Haldia Institute of Technology, Haldia, from March 1 to 3, 2023. Haldia is a city in Purba Medinipur district of Indian state West Bengal. Haldia Institute of Technology is dedicated to the objectives of creating highly trained professional manpower in various disciplines of engineering. It has gained reputation through institutional dedication to teaching and research.

In response to call for papers of ICCDC 2023, a total of 136 papers were submitted for presentation and inclusion in proceedings of conference. These papers were evaluated and ranked based on their novelty, significance and technical quality by at least two reviewers per paper. After a careful and blind refereeing process, 55 papers were selected for inclusion in the proceeding. These papers cover current research in communication, signal processing, image processing, wireless network, semiconductor devices, VLSI design, antenna design and machine learning. The conference hosted three offline talks by Prof. Arokiaswami Alphones, Nanyang Technological University, Singapore, Prof. Chinmoy Saha, Indian Institute of Space Science and Technology, Kerala, India, and Prof. Md. Saidur Rahman, Bangladesh University of Engineering and Technology, Bangladesh. The conference also hosted three virtual invited talks by Prof. Shaibal Mukherjee, Indian Institute of Technology Indore, India, Prof. (Dr.) Durbadal Mandal, National Institute of Technology Durgapur, India, and Prof. Ramesh Bansal, University of Sharjah, UAE.

A conference of this kind would not be possible without the full support from different committee members. The organizational aspects were looked after by the organizing committee members who spent their time and energy in making the conference a reality. We also thank all the technical program committee members and additional reviewers for thoroughly reviewing the papers submitted to the conference and sending their constructive suggestions to improve the quality of papers. Our hearty thanks to Springer for agreeing to publish the conference proceedings.

Special thanks to the Defence Research and Development Organisation (DRDO), Government of India, for their financial support to conduct the conference for grant success.

We are indebted to Haldia Institute of Technology for sponsoring and supporting the event. Last but not the least, our sincere thanks go to all speakers, participants all authors who have submitted papers to ICCDC 2023. We sincerely hope that the readers will find the proceedings stimulating and inspiring.

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Dhanbad, India
Kokrajhar, India
Haldia, India
Haldia, India

Prof. Dilip Kumar Sarkar
Prof. Pradip Kumar Sadhu
Dr. Sunandan Bhunia
Dr. Jagannath Samanta
Dr. Suman Paul

Message from the Volume Editors

It is a great pleasure for us to organize the 4th International Conference on *Communication, Devices and Computing* (ICCDC 2023) held from March 1 to 3, 2023 at the Haldia Institute of Technology, Purba Medinipur, West Bengal, India. Our main goal is to provide an opportunity to the participants to learn about contemporary research in communication, devices and computing and exchange ideas among themselves and with experts present in the conference as invited speakers. It is our sincere hope that the conference will help the participants in their research and training and open new avenues for work for those who are either starting their research or are looking for extending their area of research to a different area of current research in *communication, devices and computing*.

After an initial call for papers, 136 papers were submitted for presentation at the conference. All submitted papers were sent to external referees, and after refereeing, 55 papers were recommended for publication for the conference proceedings that will be published by Springer in its Lecture Notes on Electrical Engineering (LNEE) series.

Special thanks to the Defence Research and Development Organisation (DRDO), Government of India, for their financial support to conduct the conference for grant success.

We are grateful to the speakers, participants, reviewers, organizers, sponsors, and Haldia Institute of Technology for their support and help, without which it would have been impossible to organize the conference. We express our gratitude to the organizing committee members who work behind the scene tirelessly in taking care of the details in making this conference a success.

Prof. Dilip Kumar Sarkar
Prof. Pradip Kumar Sadhu
Dr. Sunandan Bhunia
Dr. Jagannath Samanta
Dr. Suman Paul

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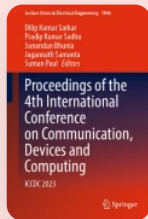
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Abstract

BCD (Binary Coded Decimal)-adder finds wide applications in favor of state-of-the-art decimal arithmetic in order to interface with binary computation. Conventionally, RCA (Ripple Carry Adder) is the building block used to generate the corrected base-10 output after two 1-digit BCD addition. The present study unfolds a novel correction strategy for speed-power efficient BCD addition. Proposed idea eliminates the complex full-adder logic cell and optimizes critical path carry propagation delay to achieve overall PDP (Power-Delay-Product) decrease with respect to conventional strategy. Proposed BCD-correction circuit is designed on 32 nm CMOS technology using BSIM4 device model and 0.9 V supply voltage at 27 °C temperature. Proposed circuit is validated and evaluated through extensive T-Spice simulations by applying all possible custom test patterns. The evaluated speed-power response is then compared with its conventional counterpart in identical operating condition and 100 MHz input to benchmark.

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