



**Proceedings of  
International Conference on  
Emerging Trends in Engineering  
and Advanced Science**

Editors:

- Md. Mohsin
- Amit Halder

Organized by

Department of Electrical and Electronic Engineering  
&  
Department of Mechatronics Engineering  
World University of Bangladesh  
Dhaka, Bangladesh

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Md. Mohsin  
Amit Halder  
(Editors)

*Proceedings of International  
Conference on Emerging Trends in  
Engineering and Advanced Science*

*ICETEAS-2021 (4-5 November, 2021)*

*Organized by*

Department of Electrical and Electronic Engineering  
&  
Department of Mechatronics Engineering,  
World University of Bangladesh,  
Dhaka, Bangladesh

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Proceedings of International Conference on Emerging Trends in Engineering and Advanced Science  
ICETEAS-2021 (4-5 November, 2021)

*Volume Editors*

- Dr. Md. Mohsin, Assistant Professor, Dept. of EEE, World University of Bangladesh
- Amit Halder, Lecturer and Coordinator, Dept. of EEE, World University of Bangladesh.

*Conference Organizers*

Department of Electrical and Electronic Engineering and Department of Mechatronics Engineering, World University of Bangladesh,  
Dhaka, Bangladesh.

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*ICETEAS-2021*

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## Foreword

It is a great honor for us to present the proceedings of ICETEAS 2021 to the authors and delegates of the event. We hope you find it useful, valuable, aspiring, and inspiring. Proceedings is a published record of papers presented by participants, indicating the progress and state of development in research at the time of writing the research article. It is a priceless resource for all researchers. Proceedings serve as a permanent record of this asset.

ICETEAS 2021 aimed to provide a forum for the exchange of ideas, issues, challenges, discoveries, opportunities, and applications of Applied Mathematics and Computational Sciences in a variety of fields. The ever-changing scope and rapid development of science and technology generates new problems, questions, and curiosity, necessitating the exchange of brilliant ideas and raising awareness of this vital research field in a variety of directions. We promise to create a colorful picture and a charming landscape for Mathematics and Computer Science. Our expectations were far exceeded by the outpouring of enthusiastic support. As a result, as we approach the end of this journey, we are filled with a sense of accomplishment and aspiration.

We are grateful to the chairman, academic advisors, and technical advisors for their assistance in making the conference a success. We would like to express our appreciation to the eminent guest speakers whose valuable ideas elevated the conference to a higher level, making it meaningful and a huge success. We would also like to express our gratitude and appreciation to all of the reviewers who assisted us in maintaining high-quality manuscripts for the proceedings, which are published by AIJR. Unfortunately, many manuscripts from prestigious institutions were rejected as a result of the review results.

We are hopeful that the proceedings of ICETEAS 2021 will be widely distributed and cross-referenced. We also appreciate the authors of ICETEAS 2021's efforts. We do our best to increase the popularity of their papers and wish them the best of luck in their future endeavors. We would also like to thank the members of the organizing team for their efforts.

**Dr. Md. Mohsin**  
**Amit Halder**  
(Editors)

## **About the Conference**

The Department of Electrical and Electronic Engineering was established in 2003 as part of the Faculty of Engineering and Science at World University of Bangladesh. The EEE Department currently has 18 faculty members and over a thousand students. This department has been able to attract high-quality students from the beginning of its existence. A large number of highly qualified and skilled graduates are demonstrating their potential both at home and abroad. The EEE Department is committed to advancing learning and to promoting research and development in related fields of knowledge. At the moment, the EEE department is planning to hold an international conference where new advances are being made at an unprecedented rate that could not be imagined. Emerging trends in advanced engineering and science must be followed in this context. This will pave the way for a new field of research that will change the world on a daily basis. The International Conference on Emerging Trends in Engineering and Advanced Science (ICETEAS) 2021 is an international conference that focuses on the latest advances and innovations in advanced science and engineering research. Submissions and proposals from enthusiastic engineers and technologists, engineering college and university faculty members, research scholars, and students presenting innovative research on all hypothetical and applied data features are encouraged. Papers that describe the application of modern engineering and technology, system execution, and lessons learned are also strengthened. These papers present new approaches or technologies, advanced prototypes, systems, tools, and techniques, and general review papers that represent future directions.

## **About the Host University**

World University of Bangladesh (WUB) established under the private University Act, 1992 (amended in 1998), approved and recognized by the Ministry of Education, Government of the People's Republic of Bangladesh and the University Grants Commission (UGC) of Bangladesh is a leading university for utilitarian education. The University is governed by a board of trustees constituted as per private universities Act 2010 which is a non-profit making concern. The university is a member of the Association of Private Universities in Bangladesh, Association of Common Wealth Universities and Quality Assurance & Improvement Council and appears in the worldwide listing of universities by the UNESCO.

### **About the Department of Electrical and Electronic Engineering**

The Department of Electrical and Electronic Engineering at World University of Bangladesh was established in 2003 under the faculty of Engineering and Science. At present, there are 26 faculty members and around 1200 students in the EEE Department. From the initial days of its establishment, this department has been able to attract the very best students of our country. From the 1st convocation to the 4th convocation, around 1300 students have been awarded B.Sc. in Electrical & Engineering degree from this department. A number of highly qualified and skilled graduates are proving their potentiality in home and abroad. The EEE Department is dedicated to the advancement of learning, and is committed to promote research and development in the related fields of knowledge.

## About the Editors

### **Dr. Md. Mohsin**

Assistant Professor, Dept. of EEE, World University of Bangladesh



Dr. Md. Mohsin is the faculty member in the department of EEE, World University of Bangladesh (WUB) since September 2009. He teaches various courses: Power System, Power System Operation and Control, Electrical Circuit, Electrical Machine, Control System, Instrumentation and Measurements, and Electromagnetics. He supervised more than 50 groups in their undergraduate final year projects. He has helped improving academic quality and laboratories of the department, forming IEEE student branch, establishing power and control system laboratories, arranging industrial tours, and organizing conferences, workshops, seminars and project exhibitions. He received the B.Sc. degree in electrical and electronic engineering (EEE) from Khulna University of Engineering and Technology (KUET), in 2005 and the M.Sc. in EEE from Bangladesh University of Engineering and Technology (BUET), in 2008. He received Ph.D. degree in EEE from Bangladesh University of Engineering and Technology (BUET), in 2019. His research interests are in the area of simulation of large scale electric power system, grid embedded renewal power system, flexible AC transmission system (FACTS) and high voltage DC (HVDC) transmission system. He has published one international journal on IEEE (USA).

### **Amit Halder**

Lecturer and Coordinator, Dept. of EEE, World University of Bangladesh.



Amit Halder is currently serving as a lecturer and also coordinator in the department of Electrical and Electronic Engineering at World University of Bangladesh. He has joined WUB on February 11, 2021. He has completed his B.Sc. (Engg.) in Electronics and Telecommunication Engineering from Rajshahi University of Engineering & Technology (RUET), Rajshahi, Bangladesh. He has completed his M.Sc. (Engg.) in Electrical and Electronic Engineering from Rajshahi University of Engineering & Technology (RUET), Rajshahi, Bangladesh. He has published 8 articles including IEEE conferences and reputed journals. He is also serving as a reviewer on Nanophotonics and Optical Engineering SPIE journal from the year 2020. His main fields of Research Interests are including of Optoelectronics, Photonics, Optical Sensors, Underwater Sensors etc.

## Message from Convener



I am overjoyed that ICETEAS-2021 is being held in its entirety at World University of Bangladesh in Dhaka. Conferences provide opportunities for researchers, faculty members, and students to network and collaborate among peer groups, as well as publications in peer-reviewed journals/proceedings.

I am confident that this Conference will provide participants with an opportunity to share their knowledge and stay up to date. We live in a time when the boundaries of knowledge are being pushed forward at a rapid pace, and this Conference will undoubtedly help to chart a new path of research. I have noticed a steady increase in the number of high-quality manuscripts submitted to the conference. The number of key persons/researchers interested in key notes and discussions at the conference is a major pillar of the conference. I would like to express my gratitude to all of the authors, reviewers, and WUB faculty members who helped make the conference a success. I anticipate that ICETEAS-2021 will be a memorable and productive event for everyone who attends.

Finally, I would like to thank AIJR publisher for their permission to publish Conference Proceedings and WUB authority for their financial support in organizing this conference.

A handwritten signature in black ink, appearing to be 'MDR' with a flourish.

Dr. Md. Riyad Tanshen  
Jr. Associate Professor,  
Department of EEE, World University of Bangladesh.

## Message from Vice Chancellor Desk



The developing trends in technologies, I am delighted to note that the Electrical & Electronics (EEE) of World University of Bangladesh is organizing a Conference on “International Conference on Emerging Trends in Engineering and Advanced Science 2021”. Certainly, this type of conference not only brings many researchers, practitioners students at one platform, but it also inculcates the research culture among the entire fraternity of Education in the country, which contributes to the development of a nation. I hope that this conference would certainly induce innovative ideas among the participants paving the way for new inventions and acceleration in Electronics, Computers and Communications.

I appreciate the efforts of the Organizing Committee and all members involved in publishing the proceedings for initiating such a conference in our esteemed University.

I wish the conference a grand success and congratulate all involved I advance.

**Prof. Dr. Abdul Mannan Choudhury**

Honorable Vice Chancellor, WUB

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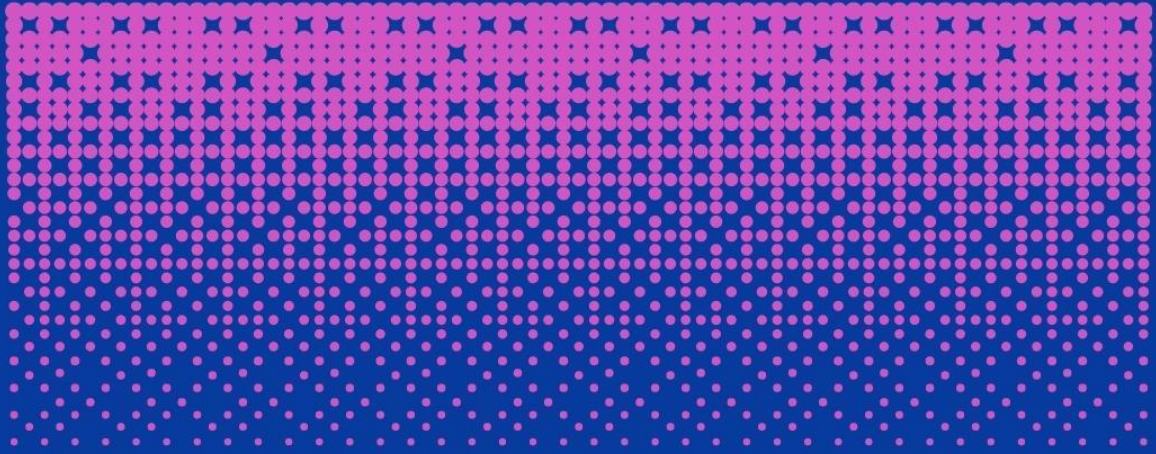
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- 2. Prof. Dr. Md. Mizanur Rahman, CE**  
Head of the Department of Mechatronics Engineering,  
World University of Bangladesh
- 3. Md. Azizul Haque, Ph. D.**  
Assistant Professor,  
Dept. of Biochemistry and Molecular Biology,  
Hajee Mohammad Danesh science and Technology University,  
Bangladesh

## **Peer Review Policy**

Authors were given the opportunity to submit full-length papers for peer review. Two (2) or more technical experts peer-reviewed each manuscript. The review is carried out in an anonymous manner. Both reviewers had to agree separately that the manuscript met the standard required for publication in these proceedings in order for it to be published. There were 30 papers submitted, with 12 being accepted for oral presentations (excluding those that were withdrawn). The committee and technical chairs would like to express their gratitude to all of the reviewers for their hard work and contributions of time, effort, and technical expertise to the review process.

## **List of Reviewers**

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