IEEE Sponsored
7th International Conference
on
Computer Applications in Electrical Engineering - Recent Advances

THEME: SUSTAINABLE TRANSPORTATION SYSTEM

October 27 - 29, 2023
Indian Institute of Technology Roorkee

Organizer: Department of Electrical Engineering, IIT Roorkee
Technical Co-sponsor
Financial Sponsors
The organizing committee is delighted to invite you to participate in the 7th International Conference on Computer Applications in Electrical Engineering-Recent Advances (CERA 23) be held in hybrid mode. It is organized by the Department of Electrical Engineering at the Indian Institute of Technology Roorkee, India. The conference would be a three-day event with technical sessions being held on October 27-29, 2023, including keynote addresses, and paper and poster presentations.

It is the flagship conference of the Department of Electrical Engineering, Indian Institute of Technology Roorkee, which happens once in four year. This time we are at its 7th edition with the theme of “Sustainable Transportation Systems”.

CERA 23 aims to provide a platform for bringing together researchers, industry professionals, and policymakers not only to discuss recent advances but also to present their recent original works in the area of smart energy systems, control design for robotics and automated vehicles, advanced signal processing techniques for smart instrumentation systems, smart drive design, power electronics, and smart transportation systems, expert systems, artificial intelligence, neural network etc. Besides research papers, CERA 23 welcomes application-oriented papers particularly relating to industry as well as papers highlighting applied problems for which appropriate solutions are being currently searched. We welcome you all and hope to see you at CERA 23. The CERA 23 is fianancially sponsored by Department of water resources and development, IIT Roorkee and IEEE Roorkee Subsection. Further, it is technically co-sponsored by IEEE UP Section.

Following are the technical tracks under which research papers are invited:

   - Grid integration of renewable energy sources
   - Smart Grid technologies and its applications
   - Renewable integration, DC and AC micro-grid
   - Smart Grid and smart cities
   - Power network dynamics and stability studies
   - Optimal power dispatch and state estimation, security analysis and control
   - Power system restructuring and deregulation
   - Technical issues in electricity market
   - Synchronization stability and restoration of electrical network

2. Smart Grid Monitoring, Control and Protection
   - Wide area monitoring, control & protection of power system
   - Smart Grid modeling and simulation with the presence of renewable energy sources
   - Design, operation and condition monitoring of power apparatus
   - Monitoring of electrical networks using SCADA and synchro-phasor Technology
   - Wide area measurement system
   - Power system protection, distribution system automation and control
   - Application of WAMS for power system control, protection and state estimation
   - Islanding detection for AC, DC and AC/DC microgrid system
   - Flexible AC transmission system, unit commitment and load dispatch
   - Optimal operation of energy sources
   - Cyber security in power systems
3. Power Electronics Converter Topologies, Devices, and Motor Drives
- Power devices, components, losses and gate drivers
- Power electronics converters and topologies
- Modelling, control and stability analysis of power converters
- EMI, EMC, protection, and fault tolerant operations
- AC, DC, BLDC, and Reluctance motor drives
- Torque and speed control methods
- Power converters and its control for motor drives
- Design and conditioning monitoring of electric machine
- Power converters for renewable integrations
- WBG enabled power electronics converters
- High frequency magnetics

4. Control Systems, Mechatronics and Robotics
- Network and cooperative control; application to physical systems
- Process control
- Robust control
- Model order reduction techniques and applications
- Linear systems theory
- Stochastic systems and estimation
- Non-linear control strategies
- Optimal and model predictive control
- Unmanned systems
- Healthcare, mobile and intelligent robotics
- Sensors, actuators and micro-nano systems
- Resilience and security for industrial applications
- Model free control design

5. Smart Instrumentation and Signal Processing
- Analytical and virtual instrumentation
- Biomedical sensors and instrumentation
- Energy harvesting for sensors
- MEMS and nano sensors
- Imaging and communication
- Medical and instrumentation uncertainty
- Biomedical instrumentation and applications
- Patient monitoring and safety
- Home automation
- Medical signal and Image processing

6. Transportation Electrification and Energy Storage Systems
- Charging infrastructure, methodology and standards
- Power electronics for EV chargers and motor drives
- V2X and G2V operation of EVs
- Renewable integration with charging infrastructure
- Battery, ultracapacitor, and hydrogen based/hybrid energy storage systems
- Energy management systems
- Wireless power transfer
- Fuel cell power electric and hybrid electric vehicles
- Vehicle dynamics and control
- Inter-vehicle and intra-vehicle Communications, infotainment and testing of EVs
- All-electric and More-electric aircrafts and ships propulsion systems
- Design, optimization and fault tolerant operations of Motors and converters for transportation
- Autonomous vehicle

7. AI/ML, IOT, Big Data Analytics
- Neural networks and fuzzy systems
- Internet of things and applications
- Data science and predictive models
- Deep learning
- Natural language processing
- Pattern recognition and machine learning techniques
- Knowledge based systems
ABOUT IIT ROORKEE

Indian Institute of Technology Roorkee is among the foremost of institutes of national importance in higher technological education and in engineering, basic and applied research. Since its establishment, the Institute has played a vital role in providing the technical manpower and know-how to the country and in pursuit of research. The Institute had celebrated its Sesquicentennial in October 1996 and now completed more than 175 years of its existence.

ABOUT DEPARTMENT OF ELECTRICAL ENGINEERING

The Electrical Engineering Department was part of the Thomson College of Engineering from the year 1897, one of the earliest such specialization in the world when the discipline itself was in its infancy. The first batch in Electrical Engineering passed out of the college in the year 1900. The department was closed down in the year 1923, following the recommendation of a special committee that the college may be converted to purely Civil Engineering Institution. This decision was not to be reversed until on the eve of being converted into a university. The Fortescu committee advised the resumption of instructions in Electrical Engineering and the present department of Electrical Engineering came into being in 1946, and the first graduates of the new department were offered courses with options in both Electrical & Telecommunication Engineering. Subsequently in 1964, the department was bifurcated to form the two departments i.e., Electrical Engineering and Electronics & Communication Engineering.

The department is a recognized centre for under-graduate, postgraduate and Ph.D. programmes. It is offering Ph.D. programme since 1964 and currently has more than 150 research scholars working in various field of electrical engineering. The Department is very active in industry-institution interaction and is providing consultancy services to the industry over the last 45 years. Number of prestigious sponsored and consultancy projects for different organisations have also been completed by the Department.
The conference would be a three-day event with technical sessions being held on October 27-29, 2023, including keynote addresses, and paper and poster presentations.

**IMPORTANT DATES**

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
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<tbody>
<tr>
<td>Last Date of Paper Submission (Extended)</td>
<td>25th July, 2023</td>
</tr>
<tr>
<td>Notification of Paper Acceptance</td>
<td>15th Aug, 2023</td>
</tr>
<tr>
<td>Early Bird Registration Start Date</td>
<td>30th Aug, 2023</td>
</tr>
<tr>
<td>Camera - Ready Paper Submission</td>
<td>10th Sept, 2023</td>
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**TECHNICAL TRACKS**

- Grid Integrated Renewable Energy Systems
- Smart Grid Monitoring, Control and Protection
- Power Electronics
- Converter Topologies, Devices, and Applications
- Robotics
- Smart Instruments and Systems
- Internet of Things, Big Data Analytics
- AI, ML, IoT, Big Data Analytics
- Energy Storage Systems
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CERA 23 invites prospective researchers, practitioners, and students worldwide to electronically submit regular paper of their original work for consideration to be presented at the conference. Prospective authors, intending to present their research papers, are requested to submit their regular papers restricted to 6-pages with IEEE double column format. The paper may be submitted in A-4 size. The author(s) should indicate the track under which paper would be considered in the conference. The research paper will be reviewed by a panel of experts from different fields. After recommendation of the reviewers, the acceptance of the paper will be sent along with the instructions for preparing the final manuscript. For paper to be published in conference, it will be obligatory for at least one of the authors to register and present the paper in the conference. All the papers presented in CERA 23 will be included in conference proceeding (soft bound) and will appear in the IEEE explorer. The template of the submitted paper can be found from https://www.ieee.org/conferences/publishing/templates.html

AWARDS

The Best paper and poster in each technical session will be facilitated with the certificates during the CERA 2023 valedictory function. Further, each participant will be given participation certificates at the end of each session by the session chairs.

HOW TO UPLOAD A RESEARCH PAPER

The research paper needs to be uploaded using the following link https://cmt3.research.microsoft.com/CERA2023/Submission/Index
The paper needs to be in IEEE double column pdf format, with a maximum size of 10Mb. Maximum page length is restricted up to six pages.

CERA 23 Expo

The industries and startup companies will be invited to participate in the exhibition being organized during the conference. They will showcase or demonstrate their products and developments during the conference which will help the attendees to enhance their research ideology and exposure towards industry oriented research.
REGISTRATION INFORMATION

The registration fee which covers the cost of conference registration kit, participation in all the activities of the conference, lunch, intersession tea and banquet is as follows:

<table>
<thead>
<tr>
<th>Attendees</th>
<th>Indian</th>
<th>International</th>
<th>SAARC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industries/Corporate Sector</td>
<td>INR. 16500</td>
<td>USD 650</td>
<td>USD 325</td>
</tr>
<tr>
<td>Teaching/ Research Organization</td>
<td>INR. 12000</td>
<td>USD 450</td>
<td>USD 225</td>
</tr>
<tr>
<td>IEEE Members</td>
<td>INR. 10000</td>
<td>USD 350</td>
<td>USD 225</td>
</tr>
<tr>
<td>Students/Research Scholars</td>
<td>INR. 5500</td>
<td>USD 225</td>
<td>USD 120</td>
</tr>
<tr>
<td>IEEE Student Member</td>
<td>INR. 4500</td>
<td>USD 180</td>
<td>USD 85</td>
</tr>
<tr>
<td>Accompanying person</td>
<td>INR. 2500</td>
<td>USD 100</td>
<td>USD 50</td>
</tr>
</tbody>
</table>

** Note: Prices are GST included

MODE OF PAYMENT

The payment of registration fee should be made online using the link below
https://www.onlinesbi.sbi/sbicollect/icollecthome.htm?corpID=365641

SPONSORSHIP

The CERA 2023 is an IEEE sponsored conference, which is financially sponsored by IEEE Roorkee subsection and technically co-sponsored by IEEE UP section. Further, the conference is likely to be sponsored by many international and national agencies such as DST, DOE, U-COST, PSUs, etc. The Indian Industry, Academia and Utilities are also invited to sponsor the conference by providing the financial support.

CULTURAL TOUR

The site seeing tours to nearby places such as Mussoorie, Haridwar & Rishikesh will be available for the participants and accompanying persons on payment basis. The industries are invited to participate in the exhibition being organized during the conference.

GANGA AARTI  HARIDWAR  RISHIKESH
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