



# 12<sup>th</sup> International Conference on Intelligent Systems and Embedded Design (ISED-2024)

**National Institute of Technology Rourkela ( India )**

**20<sup>th</sup> - 22<sup>nd</sup> Dec 2024 (Hybrid Mode)**

**CALL FOR PAPERS**

**Publications:** Accepted papers will be submitted for inclusion in IEEE Xplore subject to meeting IEEE Xplore's scope and quality requirements.

## Conference Objectives

The International Conference on Intelligent Systems and Embedded Design (ISED-2024), technically sponsored by IEEE, serves as a premier platform for researchers, academics, professionals, and industry experts to converge and exchange knowledge, ideas, and experiences in the fields of intelligent systems and embedded design. The conference aims to foster collaborative endeavours and unveil cutting-edge research that can further drive innovation and development in the interdisciplinary domains of high-performance/low-power circuits, algorithms, electronics, embedded systems, AI chips, and SoC technology, etc.

Developments in these domains will have a significant impact on the future electronic system design and advanced technologies focusing on being user-friendly, eco-sensitive, innovative, and energy efficient. The conference would enable fruitful discussions between experts and other delegates leading to concrete contributions towards advancing the state of the art. We are happy to bring ISED to the underserved regions in our effort to spur wide interest in VLSI Design and electro-optical systems.

### About the Institute/Venue:

National Institute of Technology (NIT) Rourkela is an institution of national importance funded by the Ministry of Education, India. It is situated at the heart of Steel City Rourkela, and it has one of the most beautiful landscape ecologies. NIT Rourkela was ranked 601-800 worldwide by the Times Higher Education World University Rankings of 2024 and 219 by the QS World University Ranking in the 'Asia' Category. For more details about the institute please visit us at [www.nitrkl.ac.in](http://www.nitrkl.ac.in).

**IEEE Conference Record: 63599**

### Important Dates

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|---------------------------------------|--|
| <b>Full Paper Submission:</b>         | <b>15<sup>th</sup> Aug, 2024</b>                   |
| <b>Paper Acceptance Notification:</b> | <b>16<sup>th</sup> Oct, 2024</b>                   |
| <b>Camera-Ready submission:</b>       | <b>16<sup>th</sup> Nov, 2024</b>                   |
| <b>Conference:</b>                    | <b>20<sup>th</sup> - 22<sup>nd</sup> Dec, 2024</b> |

**Submission Link:** <https://cmt3.research.microsoft.com/ISED2024>

**Conference Website:** <https://2024.isedconf.org>

### Chief Patron

Prof. K. Umamaheshwar Rao, Director, NIT Rourkela, India

### Patrons

Prof. B. D. Sahoo, HOD CSE, NIT Rourkela, India  
Prof. Priyadarsan Patra, DIT University, India/Ex-Intel Corp (USA)

### Chairperson

Prof Suchismita Chinara, NIT Rourkela, India

### Organizing Secretary

Prof. Sumanta Pyne, NIT Rourkela, India  
Prof. Shyamapada Mukherjee, NIT Rourkela, India



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## CONFERENCE TRACKS

### Pre-Conference Workshop Track Green Technology and Sustainable Embedded Systems

- Energy-efficient embedded systems design and optimization
- Renewable energy sources for powering embedded devices
- Green computing strategies for resource conservation
- Eco-friendly materials and manufacturing processes in embedded systems
- Life cycle assessment of embedded devices and technologies
- Smart grids and energy-aware communication protocols
- Sustainable practices in hardware and software development
- Carbon footprint reduction through intelligent embedded solutions
- Integration of green technology in smart cities
- Environmental and social responsibility in embedded system design

### Track 1: Embedded AI and Machine Learning

- Deep learning applications for embedded systems
- Real-time machine learning on edge devices
- Efficient algorithms for embedded AI
- Neural network optimization for resource-constrained devices
- Edge computing and distributed learning in embedded systems
- Hardware accelerators for AI inference on embedded platforms
- Explainable AI for embedded systems
- Federated learning on edge devices
- Transfer learning in resource-constrained environments
- Adaptive learning algorithms for dynamic embedded systems
- Energy-efficient training strategies for embedded AI models
- Benchmarking and performance evaluation of embedded ML models

### Track 2: IoT and Sensor Networks

- Integration of intelligent sensors in embedded systems
- Energy-efficient communication protocols for IoT devices
- Security and privacy in embedded IoT networks
- Edge computing for IoT data processing
- Sensor fusion and data analytics in embedded systems
- Wireless sensor networks for smart environments
- Edge-based anomaly detection in IoT networks
- Low-power communication protocols for sensor networks
- Cognitive IoT: Learning and adapting IoT devices
- Edge-based data aggregation and compression techniques
- Blockchain for securing IoT transactions
- Energy harvesting techniques for IoT devices

### Track 3: Embedded Systems Security

- Secure boot and firmware update mechanisms
- Hardware-based security for embedded devices
- Intrusion detection and prevention in embedded systems
- Cryptographic techniques for securing embedded communications
- Trustworthy computing in resource-constrained environments
- Security challenges in the Internet of Things (IoT) devices
- Side-channel attack mitigation in embedded systems
- Post-quantum cryptography for embedded security
- Hardware Trojan detection and prevention
- Secure bootstrapping and attestation in IoT devices
- Biometric authentication in embedded systems
- Security-aware design methodologies for embedded systems

### Track 4: Robotics and Autonomous Systems

- Intelligent control systems for robots
- Embedded vision and perception for autonomous robots
- Swarm robotics and collaborative embedded systems
- Human-robot interaction in embedded environments
- Navigation and mapping algorithms for autonomous systems
- Safety and reliability in embedded robotic systems
- Explainable decision-making in autonomous systems
- Human-aware navigation for robots
- Swarm intelligence and optimization in robotic networks
- Embedded systems for medical and healthcare robotics
- Adaptive learning for robotic task optimization
- Ethical considerations in the deployment of autonomous systems

### Track 5: Edge Computing and Fog Computing

- Architecture and design of edge/fog computing systems
- Edge-based analytics and decision-making
- Resource management and optimization in edge/fog computing
- Latency-aware applications for edge devices
- Edge intelligence for real-time data processing
- Case studies of successful edge computing implementations
- Edge-based machine learning model deployment strategies
- Adaptive resource allocation in fog computing
- Edge-based data preprocessing and filtering techniques
- Edge/fog computing for real-time video analytics
- Integration of edge computing with cloud services
- Energy-efficient algorithms for edge device communication

### Track 6: Emerging Technologies in Embedded Systems

- Quantum computing for embedded applications
- Neuromorphic computing in embedded systems
- Bio-inspired algorithms for embedded devices
- 5G and beyond for embedded communication
- Augmented reality and embedded systems
- Integration of blockchain in intelligent embedded systems
- Edge quantum computing applications
- Neuromorphic hardware design for embedded AI
- Bio-inspired sensor networks and algorithms
- Integration of AI and 5G technologies in embedded systems
- Edge-based augmented reality applications
- Robustness and security considerations in blockchain-enabled embedded systems

### Track 7: Drone Technologies and Applications

- Autonomous navigation and obstacle avoidance for drones
- Real-time embedded vision processing in drone applications
- Energy-efficient algorithms for drone flight control
- Swarming and collaborative behaviors in drone networks
- Embedded systems for aerial mapping and surveying
- Security and privacy considerations in drone communication
- Edge computing for on-board data processing in drones
- AI-based decision-making in autonomous drone missions
- Integration of sensors and actuators for enhanced drone capabilities
- Emerging trends in drone hardware design and miniaturization

### Track 8: Medical and Healthcare Embedded Devices

- Embedded systems for remote patient monitoring
- Wearable healthcare devices and biosensors
- Real-time processing of medical imaging data on embedded platforms
- Edge computing for healthcare analytics and decision support
- Secure communication in medical IoT networks
- Assistive technologies and smart prosthetics
- Embedded systems for drug delivery and dosage control
- Biomedical signal processing and analysis in embedded devices
- Patient-centric healthcare applications of embedded technology
- Ethical and regulatory considerations in medical embedded systems

### Track 9: Pollution and Environmental Monitoring

- IoT-based air quality monitoring systems
- Water quality sensing and monitoring with embedded devices
- Soil contamination detection using embedded sensors
- Noise pollution monitoring and control strategies
- Integration of drones for environmental surveillance
- Smart city solutions for pollution management
- Real-time data analytics for pollution prediction and control
- Low-power embedded systems for long-term environmental monitoring
- Crowdsourced data collection for pollution mapping
- Climate change and sustainability through embedded technologies