

Special Section: Call for Papers

Announcing a Special Section in **IEEE Access**: **Body Area Networks for Interdisciplinary Research**

Submission Deadline: February 29, 2016

IEEE Access invites manuscript submissions in the area of **Body Area Networks for Interdisciplinary Research**.

Recent advancements in integrated circuits, wireless communication, and MicroElectroMechanical Systems (MEMS) technology has enabled low power, nano-technology sensor nodes strategically deployed on the human body to be used by different applications, such as health monitoring. This new area of research is known as Body Area Networks (BAN). BAN applications cover a wide area such as sports, entertainment, military, ubiquitous health care, and many other areas. BAN has multiple opportunities of interdisciplinary research where researchers from different areas of science and technology jointly put their efforts to improve the human body monitoring and performance. Due to these joint efforts, BAN is now evolving into Body Area Nano Networks (BANNs). The BANNs are further extended with Internet of Nano Things and Internet of Bio-Nano Things technologies.

The objective of this Special Section in *IEEE Access* is to showcase the most recent advances in interdisciplinary research areas encompassing BAN. This Special Section will bring together researchers from diverse fields and specializations, such as communications engineering, computer science, electrical, and electronics engineering, educators, mathematicians, medical, and specialists in areas related to BAN. We invite researchers from academia, industry, and government to discuss challenging ideas, novel research contributions, demonstration results, and standardization efforts on the BAN and related areas.

The list of topics includes, but is not limited to:

Body Area Networks

- Context and situation awareness
- Sensory augmentation
- Motion detection and activity recognition
- E-Health systems and electronic medical records
- Hardware architecture and implementation
- Medical imaging and patient diagnostic systems
- Human body communication
- International standards and regulatory matters
- Physiological parameters, measurements
- Communication Architecture of BANs (Intra-BAN, Inter-BAN, Beyond-BAN)
- BAN addressing and routing protocols
- MAC Layer protocols for BANs
- Cross layer routing protocols for BANs
- Radio technologies for BANs, Bluetooth, ZigBee, Ultra-wideband, etc.

- Radio coexistence and robustness
- Various kinds of BANs
- Signal/information processing and communication models for BANs
- BAN architectures and protocols
- Power-efficient communications
- Wireless energy transfer
- Sensing and actuation in BANs
- Software engineering and systems engineering for BANs
- Modeling, simulations and empirical experiments
- Design and performance issues
- Tools, testbeds and deployment issues
- Standardization of BANs
- Delay-tolerance, fault-tolerance and reliability in BANs

Body Area Networks Applications

- Pervasive health care and patient monitoring
- Ambient assisted living
- Tele-medicine systems
- Wearable health monitoring
- Aiding professional and amateur sports training
- New medical diagnostics and treatments
- Real time streaming
- Entertainment applications
- Emergency (non-medical)

Cloud Computing and BANs

- Cloud-based BAN healthcare solutions
- Healthcare based cloud deployment models
- Offloading and networking in healthcare using cloud
- Cloud governance in health environments
- Tools and technologies in BANs, pervasive and sensor technologies that make use of cloud facilities
- Cloud-based usage analytics /event management
- Mobility challenges in implementing BAN integrated mobile cloud systems
- Image Processing techniques to securely transmit the BAN data to cloud
- Encrypted storage of healthcare related BAN data in cloud
- Access controls, roles, and application-based access to cloud specific records
- Standardizations

Security and Privacy for BANs

- Security and trust establishment for BANs
- Lightweight privacy preserving protocol design for data sensing, transmission and processing
- Physical layer security in BANs
- Cross layer design for security, privacy and trust in BANs
- Biometrics security for BANs
- Security threats/ attacks and their mitigations in BAN
- Theoretical security design using game theory or information theory

- Body Area Nano Networks (BANNs)
- Intra-body channel modeling and capacity analysis
- Modulation and channel coding
- Routing and MAC Protocols for BANNs
- Mathematical modeling of biochemical, and/or electrochemical processes
- Neuronal communication network analysis
- Noise analysis in action potential propagation
- Computer simulation of neuronal networks
- Nanoscale neuronal interfaces
- Nano-device and nano-antennas design for BANNs
- Nanomaterial- and metamaterial-based nano-antennas for BANNs
- Nano-antenna arrays for BANNs
- Signal generators & detectors for BANNs
- Modulators & demodulators for BANNs
- Nano-processors and nano-memories, filters & amplifiers for BANNs
- Nano-batteries and energy harvesting
- Nano-sensors and electromagnetic nanoparticles
- Applications of BANNs
- Nano-sensing for health monitoring
- Human life enhancement
- Electromagnetic interference (EMI) analysis for BANNs
- Application case studies and testbeds

BAN integrated Internet of Bio-Nano Things (IoBNTs)

- Molecular communication enabled BAN integrated IoBNTs
- Channel modeling for molecular communication, including open and fluidic environments and intra-/inter-cellular propagation
- Information theory for nanoscale communication networks of BAN integrated IoBNTs
- Communication theoretical approaches for BAN integrated IoBNTs
- Deployment and topology management in BAN integrated IoBNTs
- Network architecture and protocols for BAN integrated IoBNTs
- Experiments, implementation, and testbeds for BAN integrated IoBNTs
- Interfaces among BAN integrated nanoscale communication networks
- Energy efficiency in BAN integrated nanoscale communication networks
- Nano-computing paradigms, including neuromorphic computing, DNA and molecular computing, membrane computing and quantum computing
- Security and trust establishment for BAN integrated IoBNTs

We also highly recommend the submission of multimedia with each article as it significantly increases the visibility, downloads, and citations of articles.

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