



## CALL FOR PAPERS FOR SPECIAL SESSION PROPOSAL

**SPECIAL SESSION 8**

### Intelligent Sensing and AI-Driven Digital System for Patient Monitoring and Personalised Healthcare

#### Session description :

This special session focuses on the convergence of intelligent sensing technologies and machine learning for continuous, non-invasive patient monitoring and personalised healthcare delivery. Chronic and complex conditions, including neurological disorders, cardiovascular disease, respiratory illness, musculoskeletal impairment, and oncological comorbidities, place sustained demands on healthcare systems that conventional episodic clinical assessment is poorly equipped to meet. Wearable biosensors, electrophysiological recording systems (EEG, ECG, EMG), microwave and radar-based contactless sensing platforms, and optical modalities now make it technically feasible to acquire rich physiological data continuously and outside the clinical setting. The central challenge is no longer data acquisition but signal fidelity, computational interpretability, and the extraction of clinically valid digital biomarkers from noisy, heterogeneous, real-world data streams.

This session invites original research that bridges sensing hardware, signal processing methodology, and AI-driven analytics to address that challenge. Contributions may span wearable sensor design and validation, physiological time-series analysis, deep learning for biomarker extraction, edge computing for real-time inference, remote and home-based monitoring systems, multi-modal data fusion, and the ethical and regulatory dimensions of deploying AI in clinical contexts. Work addressing any patient population or disease domain is welcome, provided it engages substantively with sensing system design, signal processing, or AI-based inference. The session is deliberately broad in scope to attract contributions from biomedical engineering, clinical informatics, signal processing, machine learning, and applied AI communities, while maintaining a unified focus on the translation of sensing and AI methods into tangible healthcare benefit.

#### Session chairs :

- **Rahmat Ullah**, Essex Univ., UK
- **Rab Nawaz**, Essex Univ., UK
- **Yasir Javed**, Prince Sultan Univ.,KSA

#### Topics of interest (not limited to) :

- Wearable and body-worn biosensor systems: design, validation, and clinical deployment for chronic disease management;
- Electrophysiological signal processing: EEG, ECG, and EMG analysis for neurological, cardiac, and neuromuscular monitoring;
- Contactless and non-invasive sensing: microwave, radar, optical, and RF-based modalities for remote physiological measurement;
- Machine learning and deep learning for digital biomarker extraction, physiological classification, and clinical event prediction;
- Multi-modal sensor fusion and edge computing for real-time, resource-constrained health monitoring in ambulatory and home-based settings;
- Telemedicine platforms and remote patient monitoring: data pipelines, interoperability standards, and clinical validation frameworks
- AI-assisted rehabilitation, human activity recognition, motion analysis, and assistive technologies for functional health assessment;
- Ethical, regulatory, and data governance considerations in AI-driven digital health systems (GDPR, FDA/CE marking, algorithmic bias)

#### Important Dates



#### Sponsors



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