Special Issue

New Advances in Electrocardiogram (ECG) Signal Processing

Message from the Guest Editor

Recent advances in ECG signal processing have significantly enhanced cardiovascular diagnostics through improved denoising, feature extraction, and classification. Traditional methods like wavelet transforms have evolved into adaptive techniques including empirical mode decomposition and sparse representation using Gabor dictionaries, enabling precise noise suppression while preserving signal morphology. The field has shifted from conventional time-domain analysis to deep learning approaches using CNNs and RNNs/LSTMs, achieving 98-99% classification accuracy for arrhythmia detection. Emerging techniques incorporate explainable AI, federated learning for privacy preservation, and multi-modal biosignal fusion to address inter-patient variability. These innovations are now being implemented in wearable devices, enabling continuous, low-power ECG monitoring for telemedicine applications. This Special Issue invites contributions on novel ECG processing methods and their clinical implementations.

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As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal *Applied Sciences* has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

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