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Dr. Chunyu Tan is a Lecturer and Master's Supervisor at the School of Artificial Intelligence, Anhui University, China. Her research interests include biomedical signal processing and human–computer interaction. She has led projects funded by the National Natural Science Foundation of China and serves as a reviewer for several international journals.

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Speech Title (English):

ECG Biometric Identification Using SAFD Enhanced Self-organized Operational Networks

Speech Abstract

Electrocardiogram (ECG) signals provide a reliable and secure biometric modality, making them well suited for continuous authentication in wearable devices. However, many existing deep learning methods rely on complex model architectures, which limits their practical use on wearable platforms with limited computational resources. In this talk, I will present SAFD-SOONet, a compact and efficient framework for ECG biometric identification that combines stochastic adaptive Fourier decomposition (SAFD) with Self-organized Operational Networks (Self-ONNs). SAFD enables effective time–frequency feature extraction from ECG signals, while Self-ONNs improve learning capability through flexible nonlinear neuron structures. This combination allows the model to achieve strong performance using a simple and compact network architecture. This work provides a practical approach for developing accurate and efficient ECG-based biometric systems and supports the advancement of secure and continuous authentication in wearable technologies.