Supplementary Table 3. Signal Processing Studies

Çalışmanın Başlığı	Yazar(lar)	Yayın Yılı	Population	Model	Performance
International evaluation of an artificial intelligence-powered electrocardiogram model detecting acute coronary occlusion myocardial infarction.	Herman et al.	2024	18,616 ECGs from 10,543 suspected ACS patients	Deep convolutional neural networks (CNN)	AI model sensitivity 80.6%, specificity 93.7%, AUC 0.938
Early identification of stroke through deep learning with multi-modal human speech and movement data.	Ou et al.	2025	253 participants: 132 stroke patients, 121 healthy controls	Transformers (AMMA), VGGish, ResNet50	Multimodal AUC: 0.882; Video-only AUC: 0.830; Audio-only AUC: 0.779
Use of artificial intelligence-powered ECG to differentiate between cardiac and pulmonary pathologies in patients with acute dyspnoea in the emergency department.	Jang et al.	2024	3105 patients (1197 cardiac-origin dyspnoea, 1908 pulmonary-origin dyspnoea)	Transformer neural networks, LightGBM	AI-ECG AUC: 0.938; sensitivity: 93.0%; specificity: 79.5%
Smartphone AI vs. Medical Experts: A Comparative Study in Prehospital STEMI Diagnosis.	Lee et al.	2024	53 patients with suspected STEMI evaluated in prehospital phase	Deep learning (Quantitative ECG Analyzer, qSTEMI)	qSTEMI AUC: 0.815; sensitivity: 0.750; specificity: 0.862
Performance of ECG-Derived Digital Biomarker for Screening Coronary Occlusion in Resuscitated Out-of-Hospital Cardiac Arrest Patients: A Comparative Study between Artificial Intelligence and a Group of Experts.	Park et al.	2024	82 OHCA patients; 58 included after exclusions	Quantitative ECG (QCG) system, Deep Learning	QCG AUC: 0.770; sensitivity: 70.8%; specificity: 79.4%
Intelligent alert system for predicting invasive mechanical ventilation needs via noninvasive parameters: employing an integrated machine learning method with integration of multicenter databases.	Zhang et al.	2024	14,229 hospitalized patients (6600 from MIMIC-III, 7629 from UMC). Inclusion criteria: ICU patients aged 18+ with ICU stay of 1-28 days.	LightGBM, XGBoost, AdaBoost, Random Forest, Naive Bayes, Neural Network, Logistic Regression, Integrated Machine Learning (Voting Method).	The machine learning model achieved AUC 0.935 (MIMIC-III) and 0.727 (UMC validation), outperforming traditional algorithms (PaO2/FiO2: 0.532, OSI: 0.608).

An Arrhythmia classification approach via deep learning using single-lead ECG without QRS wave detection.	Liu et al.	2024	ECG data from PhysioNet, including MIT-BIH Arrhythmia, Atrial Fibrillation, and Ventricular Fibrillation Databases.	Convolutional Neural Networks (CNN)	The CNN model achieved 97.31% classification accuracy, successfully distinguishing NSR, AFIB, AFL, WPW, VF, VT, VFL, MII, and SB.
Prediction of blood pressure using chest compression waveform during cardiopulmonary resuscitation.	Han et al.	2024	19 cardiac arrest patients (mean age: 66 ± 13 years, 14 men) receiving CPR in an emergency department.	Gaussian Process Regression (GPR), feature selection with Neighborhood Component Analysis (NCA), trained with MATLAB.	High correlation between predicted and actual values: SBP r=0.954, DBP r=0.926, MBP r=0.958; accurate real-time blood pressure estimation.
A data-driven computational methodology towards a pre-hospital Acute Ischaemic Stroke screening tool using haemodynamics waveforms.	Sen et al.	2024	Simulated haemodynamic data representing healthy and different Acute Ischemic Stroke (AIS) scenarios using a population-based database.	Convolutional Neural Network (CNN)-based classifiers, Machine Learning-based Reduced Order Model (ML-ROM) for real-time healthy waveform prediction.	True prediction rate exceeding 95% for thrombus region classification; inclusion of up to 20% noise reduced accuracy to 80% for region detection and 70% for bifurcation generation detection.
Development of Prediction Model for Intensive Care Unit Admission Based on Heart Rate Variability: A Case-Control Matched Analysis.	Choi et al.	2024	610 patients (122 admitted to ICU, 488 control) from a tertiary hospital's ED and OR dataset, aged <75 years.	Generalized linear mixed models (GLMM)	GLMM achieved an AUC of 0.947 (95% CI: 0.906–0.987), demonstrating strong predictive accuracy for ICU admission.
Point-of-care breath sample analysis by semiconductor-based E-Nose technology discriminates non-infected subjects from SARS-CoV-2 pneumonia patients: a multi-analyst experiment.	Woehrle et al.	2024	126 subjects: 63 SARS-CoV-2 positive, 63 non-infected	RF, Gradient Boosting (LightGBM), Extra Tree (ET), Decision Tree (DT), Multi-layer Perceptron (MLP)	Averaged AUC > 90%, misclassification error < 19%. Identified the most relevant sensor for classification success. Sensitivity and specificity were comparable to PCR and superior to antigen tests.