PAPER REVIEW 2022-01-10

Dongwook Kwon

Arrhythmia Detection from 2-lead ECG using Convolutional Denoising Autoencoders

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Biomedical Signal Processing and Control 71 (2022) 103228

Contents lists available at ScienceDirect

Biomedical Signal Processing and Control

journal homepage: www.elsevier.com/locate/bspc

Arrhythmia classification of LSTM autoencoder based on time series anomaly detection

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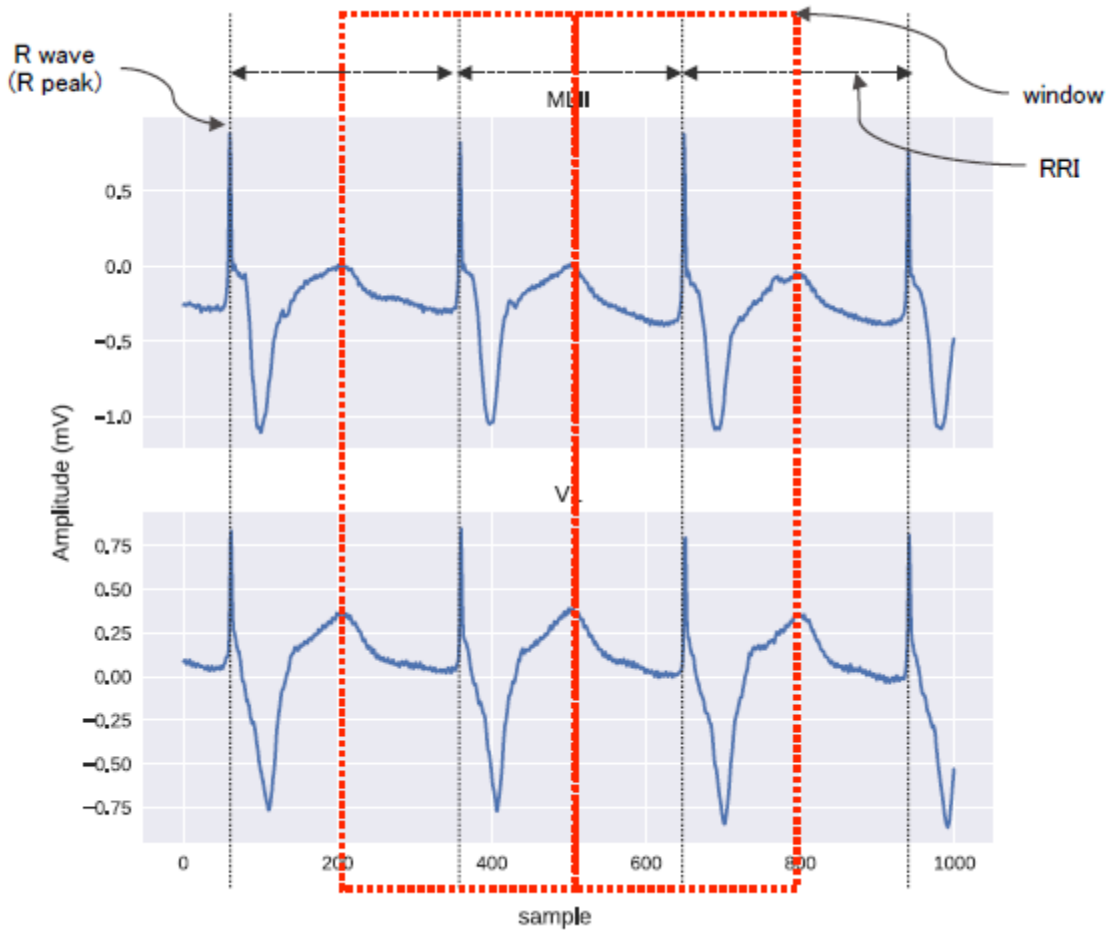
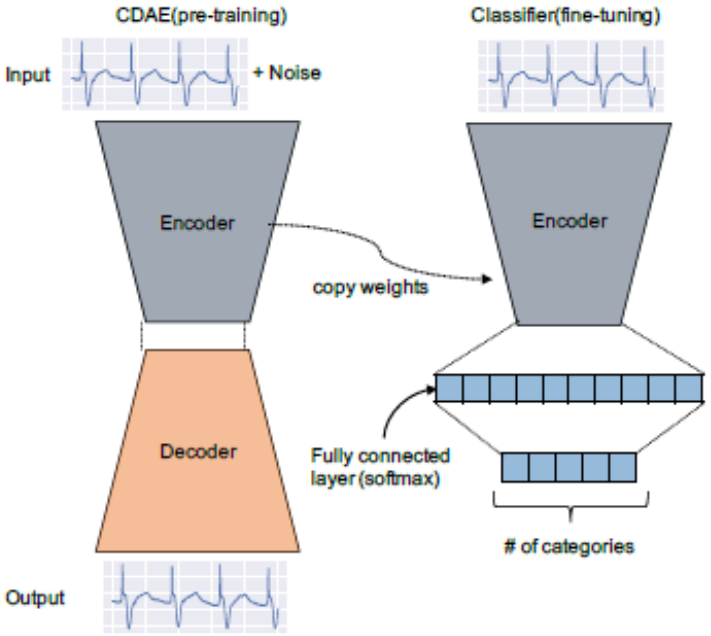
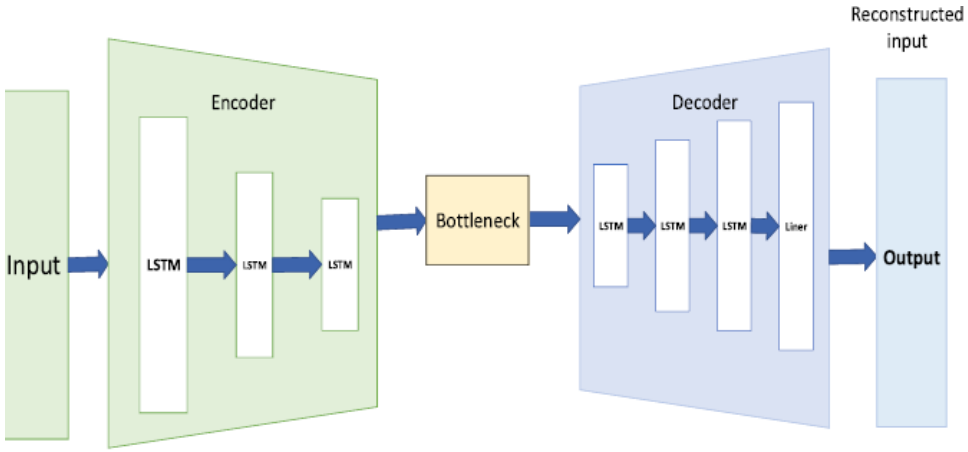


Multivariate Time Series Data





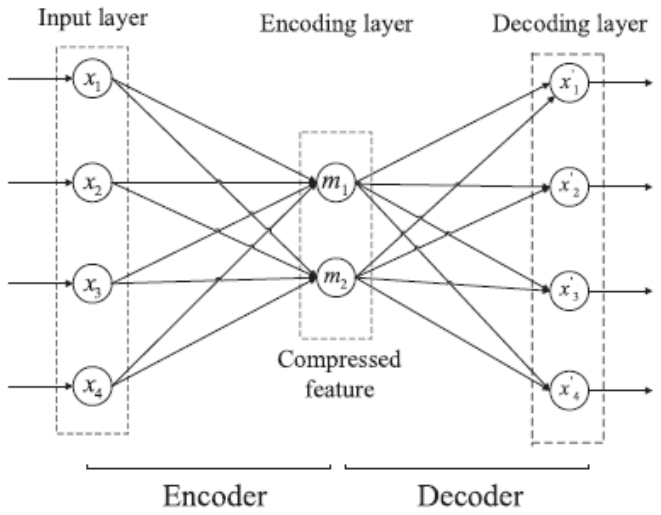
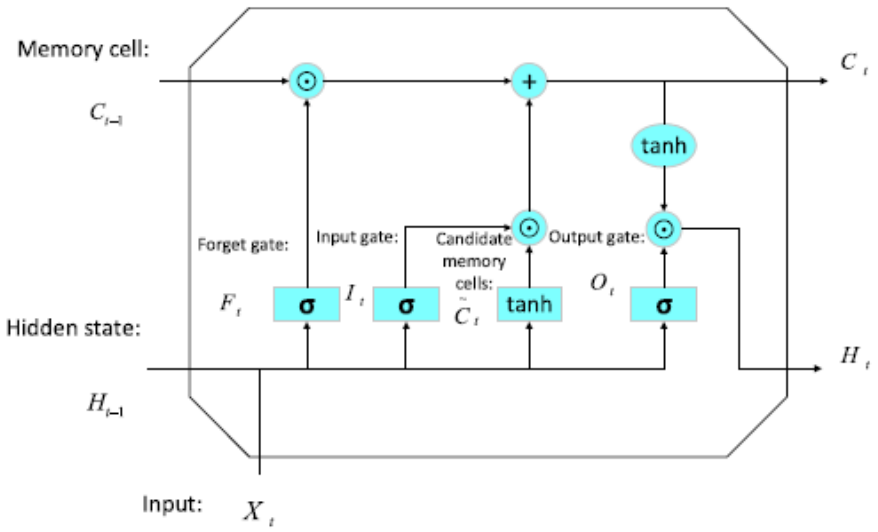
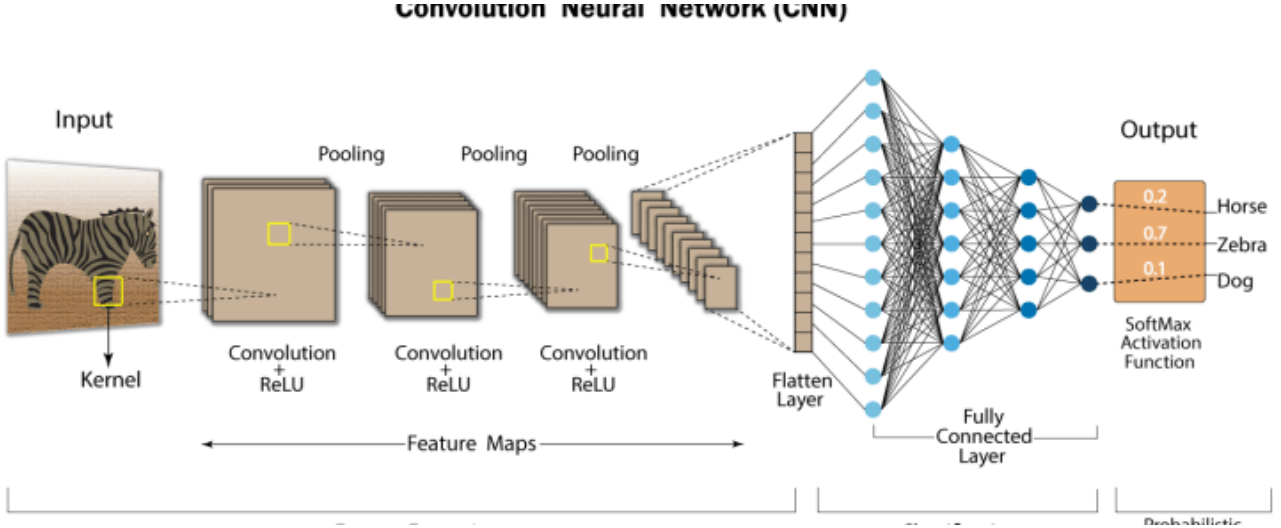
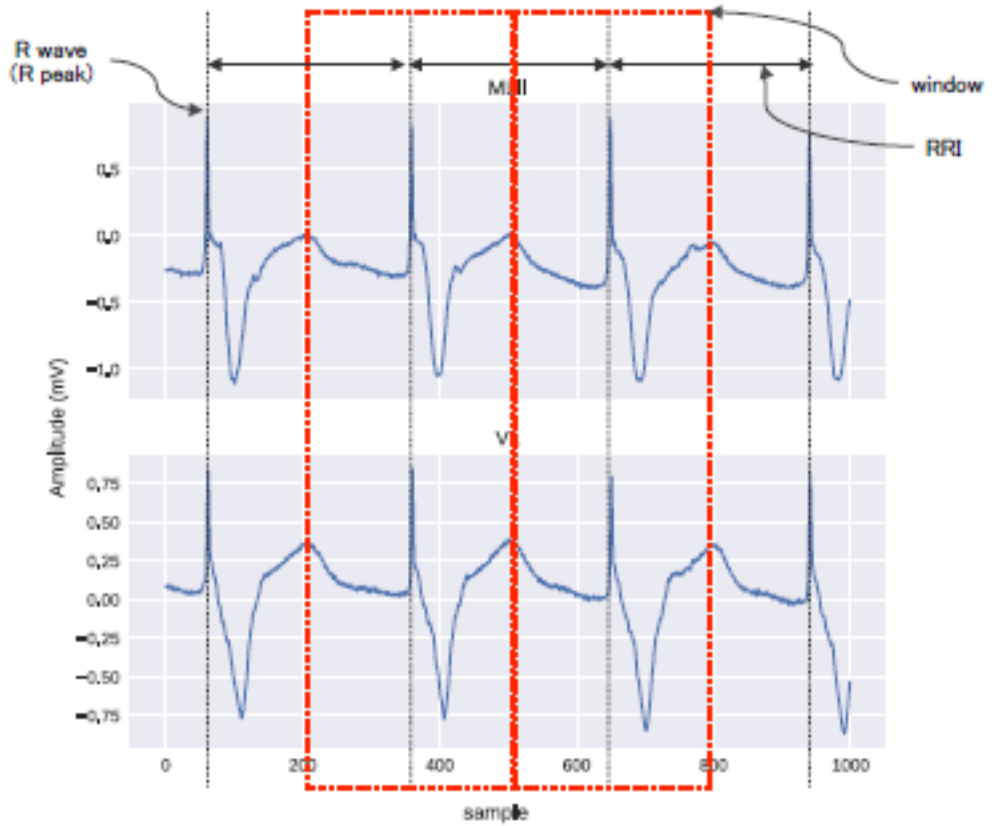


Fig. 6. The structure of autoencoder.

Auto Encoder


Memory cell:
C_{t-1}
C_t
tanh
Forget gate:
Input gate:
Candidate memory cells:
Output gate:
F_t
σ
I_t
σ
$\tilde{C}_t$
tanh
O_t
σ
Hidden state:
H_{t-1}
H_t
Input: X_t


Convolution Neural Network (CNN)
Input
Pooling
Pooling
Pooling
Output
0.2
Horse
0.7
Zebra
0.1
Dog
Kernel
Convolution + ReLU
Convolution + ReLU
Convolution + ReLU
Flatten Layer
SoftMax Activation Function
Feature Maps
Fully Connected Layer



Anomaly Detection