

# 基于卷积神经网络重建十二导联心电图

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**摘要:** 由矢量心电图衍生标准十二导联心电图的传统方法是 Dower 转换, 由于模型过于简单, 在心电图细节方面重建效果不佳. 为了提高衍生效果, 提出一种基于卷积神经网络的衍生方法. 首先采用卷积自编码器获取 Frank 正交导联心电图的高级语义, 然后利用卷积神经网络实现从编码层重建标准十二导联心电图. 最后采用 R2 和相关系数作为评判标准来分析结果, 均明显优于传统算法, 这充分证明了采用卷积神经网络衍生心电图这一方法的有效性和优异性.

**关键词:** 心电图; 卷积神经网络; 自编码器; 矢量心电图

## 12-lead ECG reconstruction using convolutional

### neural network

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**Abstract:** The tradition reconstruction of the convolutional 12-lead electrocardiography(EGC) is Dower transform, but the model is too simple that the performance about detail is poor. To improve the performance, we raise a new way for reconstruction based on convolutional neural networks(CNN). At first, in order to get the high semantic of the Frank XYZ-lead ECG, we train one auto-encoder model (AE) based on convolutional neural networks. Then we train an CNN model for reconstructing 12-lead of which the input layer is the encoder layer of the AE. At last, to judge the performance of the model, R2 and percent correlation are adopted for evaluating the results. The result proves that CNN model is quite suitable and outstanding.

**Key words:** electrocardiography; convolutional neural network; auto encoder; vectorcardiogram

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