

Accepted Manuscript

Automated identification of shockable and non-shockable life-threatening ventricular arrhythmias using convolutional neural network

U Rajendra Acharya, Hamido Fujita, Shu Lih Oh, U Raghavendra, Jen Hong Tan, Muhammad Adam, Arkadiusz Gertych, Yuki Hagiwara



PII: S0167-739X(17)31524-8
DOI: <http://dx.doi.org/10.1016/j.future.2017.08.039>
Reference: FUTURE 3634

To appear in: *Future Generation Computer Systems*

Received date: 12 July 2017
Revised date: 3 August 2017
Accepted date: 20 August 2017

Please cite this article as: U.R. Acharya, H. Fujita, S.L. Oh, U. Raghavendra, J.H. Tan, M. Adam, A. Gertych, Y. Hagiwara, Automated identification of shockable and non-shockable life-threatening ventricular arrhythmias using convolutional neural network, *Future Generation Computer Systems* (2017), <http://dx.doi.org/10.1016/j.future.2017.08.039>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Automated identification of shockable and non-shockable life-threatening ventricular arrhythmias using convolutional neural network

U Rajendra Acharya^{1,2,3}, Hamido Fujita^{4*}, Shu Lih Oh¹, U Raghavendra⁵, Jen Hong Tan¹, Muhammad Adam¹, Arkadiusz Gertych⁶, Yuki Hagiwara¹

¹Department of Electronics and Computer Engineering, Ngee Ann Polytechnic, Singapore.

²Department of Biomedical Engineering, School of Science and Technology, Singapore University of Social Sciences, Singapore.

³Department of Biomedical Engineering, Faculty of Engineering, University of Malaya, Malaysia.

⁴Iwate Prefectural University (IPU), Faculty of Software and Information Science, Iwate 020-0693 Japan.

⁵Department of Instrumentation and Control Engineering, Manipal Institute of Technology, Manipal University, Manipal, India 576104.

⁶Department of Surgery, Department of Pathology and Laboratory Medicine, Cedars-Sinai Medical Center, Los Angeles, California, USA.

*Corresponding Author

Postal Address: ⁴Iwate Prefectural University (IPU), Faculty of Software and Information Science, Iwate 020-0693 Japan

Telephone: +81-19-694-2578; Email Address: hfujita-799@acm.org

Abstract

Ventricular tachycardia (VT) and ventricular fibrillation (VFib) are the life-threatening shockable arrhythmias which require immediate attention. Cardiopulmonary resuscitation (CPR) and defibrillation are highly recommended means of immediate treatment of these shockable arrhythmias and to resume spontaneous circulation. However, to increase efficacy of defibrillation by an automated external defibrillator (AED), an accurate distinction of shockable ventricular arrhythmias from non-shockable ones needs to be provided upfront. Therefore, in this work, we have proposed a novel tool for an automated differentiation of shockable and non-shockable ventricular arrhythmias from 2 seconds electrocardiogram (ECG) segments. Segmented ECGs are processed by an

Download English Version:

<https://daneshyari.com/en/article/6873370>

Download Persian Version:

<https://daneshyari.com/article/6873370>

[Daneshyari.com](https://daneshyari.com)