DECLARATION OF GERARD P. GRENIER

I, Gerard P. Grenier, am over twenty-one (21) years of age. I have never been convicted of a felony, and I am fully competent to make this declaration. I declare the following to be true to the best of my knowledge, information and belief:

1. I am Senior Director of Publishing Technologies of the Institute of Electrical and Electronics Engineers, Inc. ("IEEE").

2. IEEE is a neutral third party in this dispute.

3. Neither I nor IEEE itself is being compensated for this declaration.

4. Among my responsibilities as Senior Director of Publishing Technologies, I act as a custodian of certain records for IEEE.

5. I make this declaration based on my personal knowledge and information contained in the business records of IEEE.

6. As part of its ordinary course of business IEEE publishes and makes available technical articles and standards. These publications are made available for public download through the IEEE digital library, IEEE Xplore.

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8. The article below has been attached as Exhibits A to this declaration:

A.	R.G. Lee, et al. "A Mobile Care System With Alert Mechanism" IEEE Transactions on Information Technology in Biomedicine, Vol. 11, Issue 5, September 2007.

9. I obtained a copy of Exhibit A through IEEE Xplore, where it is maintained in the ordinary course of IEEE's business. Exhibit A is a true and correct copy of the Exhibit as it existed on or about November 10, 2016.

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11. R.G. Lee, et al. "A Mobile Care System With Alert Mechanism" was published in IEEE Transactions on Information Technology in Biomedicine, Vol. 11, Issue 5. IEEE Transactions on Information Technology in Biomedicine, Vol. 11, Issue 5 was published in September 2007. Copies of this publication were made available no later than the last day of the stated publication month. The article is currently available for public download from the IEEE digital library, IEEE Xplore.

12. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001.

I declare under penalty of perjury that the foregoing statements are true and correct.
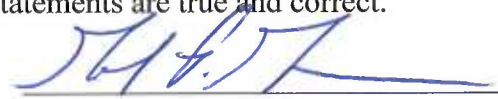
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Abstract:

Hypertension and arrhythmia are chronic diseases, which can be effectively prevented and controlled only if the physiological parameters of the patient are constantly monitored, along with the full support of the health education and professional medical care. In this paper, a role-based intelligent mobile care system with alert mechanism in chronic care environment is proposed and implemented. The roles in our system include patients, physicians, nurses, and healthcare providers. Each of the roles represents a person that uses a mobile device such as a mobile phone to communicate with the server setup in the care center such that he or she can go around without restrictions. For commercial mobile phones with Bluetooth communication capability attached to chronic patients, we have developed physiological signal recognition algorithms that were implemented and built-in in the mobile phone without affecting its original communication functions. It is thus possible to integrate several front-end mobile care devices with Bluetooth communication capability to extract patients' various physiological parameters [such as blood pressure, pulse, saturation of haemoglobin (SpO_2), and electrocardiogram (ECG)], to monitor multiple physiological signals without space limit, and to upload important or abnormal physiological information to healthcare center for storage and analysis or transmit the information to physicians and healthcare providers for further processing. Thus, the physiological signal extraction devices only have to deal with signal extraction and wireless transmission. Since they do not have to do signal processing, their form factor can be further reduced to reach the goal of microminiaturization and power saving. An alert management mechanism has been included in back-end healthcare center to initiate various strategies for automatic emergency alerts after receiving emergency messages or after automatically recognizing emergency messages. Within the time intervals in system setting, according to the medical history of a specific patient, our prototype system can inform various healthcare providers in sequence to provide healthcare service with their reply to ensure the accuracy of alert information and the completeness of early warning notification to further improve the healthcare quality. In the end, with the testing results and performance evaluation of our implemented system prototype, we conclude that it is possible to set up a complete intelligent health care chain with mobile monitoring and healthcare service via the assistance of our system.

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Abstract

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mobile care system, healthcare service, healthcare quality, emergency messages, back-end healthcare center, wireless transmission, signal extraction devices, information transmission, information analysis, information storage, front-end mobile care devices, physiological signal recognition algorithm, Bluetooth communication, mobile phone communication, chronic care environment, role-based intelligent mobile care system, professional medical care, health education, patient monitoring, physiological parameters, chronic diseases, arrhythmia, hypertension, alert mechanism

Author Keywords

ubiquitous, Alert, Bluetooth, Java programming, mobile care, mobile phone

Cellular Phone, Diagnosis, Computer-Assisted, Electrocardiography, Ambulatory, Feasibility Studies, Heart Diseases, Humans, Mobile Health Units, Pilot Projects, Remote Consultation, Taiwan

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