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강연 제목: 일상 심혈관 건강 모니터링을 위한 개인용 멀티모달 스마트 청진기

A personal multimodal smart stethoscope for daily cardiovascular health
monitoring

Abstract:

Heart sound and heart rate (pulse) are the most common physiological signals to diagnose cardiovascular diseases. Measuring these signals using one device and analyzing their interrelationships simultaneously can improve the accuracy of existing methods and propose new approaches for diagnosing cardiovascular diseases. Therefore, a personal multi-modal smart stethoscope with dual deterministic model-based heart sound analysis (DDM-HSA) has been developed for daily cardiovascular health monitoring. The proposed device is designed as a compact PC mouse for easy grasping and attachment to the surface of the chest using only one hand. A digital microphone and photoplethysmography (PPG) sensor are installed on the bottom and top surfaces of the device, respectively, to simultaneously measure heart sound and pulse from the user's chest and finger. Also, the DDM-HSA is designed in a parallel structure that uses these two physiological signals related to the heartbeat, enabling more accurate heart sound identification. The experimental results show that the promising performance of the proposed device with the DDM-HSA had the highest performance in automatic S1 and S2 heart sound identification. The findings of this study are anticipated to provide improved technology to detect heart sounds and analyze cardiac activities using only physiological signals that wearable devices can measure in a mobile environment for daily life.

Brief Biosketch

2021 ~ 현재 주식회사 클레어오디언스, 대표

2015 ~ 현재 계명대학교 공과대학 의용공학과, 조교수

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