TECHNOLOGY

Health and Disease Monitoring in the Heart and the Aorta based on Model-Based Ballistocardiogram Analysis

OVERVIEW

Background:
Ballistocardiogram (BCG) is a direct consequence of how the heart ejects blood, thus its waveform can have a lot to do with the cardiac function. Many efforts have been made to mathematically relate the abnormalities in the BCG waveform to heart disease. However, the existing technologies only qualitatively explain the coupling between the BCG and cardiac functions. None of the existing technologies have been successful in connecting the two based on an explicit mathematical relationship.

Invention description:
Researchers at the University of Maryland have developed a method to analyze the BCG signal using a mathematical model. The mathematical model relates the BCG to systemic arterial blood pressure and flow. The arterial pressure information is interpreted to detect any abnormalities in blood pressure associated with proximal and distal arteries. This information can be used to detect and diagnose heart and vascular diseases.

Advantages:
1) Low-cost and Non-intrusive tool for screening heart diseases

Applications:
1) Medical and healthcare devices for screening of heart and vascular diseases
2) Embedded medical devices for everyday life (e.g. Beds with heart and arterial monitoring capabilities)
3) Ubiquitous medical devices like scales and wrist watches with heart health monitoring capabilities

CONTACT INFO

UM Ventures
0134 Lee Building
7809 Regents Drive
College Park, MD 20742
Email: umdtechtransfer@umd.edu
Phone: (301) 405-3947 | Fax: (301) 314-9502

Additional Information

INSTITUTION

University of Maryland, College Park

PATENT STATUS

Pending

EXTERNAL RESOURCES

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