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Meet the Inventors

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Department

Mathematics

Publication(s)

External Link(s)

- From the lab of Dr. Hau-Tieng Wu

A software for more easily monitoring physiological data through improved visualization and machine learning analysis

Value Proposition

With inexpensive wearable sensors, physiological data monitoring has extended beyond clinical anesthesia and emergency medicine and into in-home healthcare. Waveforms such as electrocardiography (ECG) and photoplethysmography (PPG) contain valuable information about a patient's physiological state, however, current analysis tools which often includes simple visual inspection by a clinician fail to extract and utilize this information to the greatest possible extent. The current analysis tools of these physiological signals leave much room for improved physiological state monitoring and event detection all which can aid a clinician in providing the best possible care.

Technology

This technology is a software that extracts and tracks over time the underlying physiological state that produces the observed physiological signal. This is intended to be implemented into physiological monitoring devices to assist clinicians, and applications including continuous patient monitoring, automated arrhythmia detection, and physiological data analysis and visualization. Using a wave shape model, this technology finds a low-dimensional representation of the observed data. In such a representation, physiological state is more easily visualized and anomalous events and long-term deterioration of a patient's state can be easily detected, something that has been a challenge for existing analysis tools. This technology has been demonstrated with arterial blood pressure signals and an electrocardiogram (ECG).

Advantages

- Improved monitoring of a patient's physiological state
- Improved detection of anomalies can lead to faster responses and better patient outcomes