Research Commercialization

**PulseLab: An Integrated and Expandable Toolbox for Pulse Wave Velocity-base Blood Pressure Estimation**

*Technology #2022-007*

**Invention Summary:**

Cuff-less blood pressure (BP) estimation methods have been long pursued as substitutions for the conventional BP measurement methods to facilitate continuous and automatic monitoring of BP. The PWV (pulse wave velocity)-BP models, describing the relationship between the PWV and the BP, have been derived and used in recent BP-estimation studies. However, currently, there exist no toolboxes and graphical user interfaces (GUIs) that enable pre-processing, visualization and analysis of signals for the problem of BP estimation.

Rutgers researchers have developed *PulseLab*, a comprehensive MATLAB toolbox that enables estimating the BP from electrocardiogram (ECG) and photoplethysmogram (PPG) signals using pulse PWV-based models. This universal framework consists of 6 sequential modules, covering end-to-end procedures that are needed for estimating BP from raw PPG/ECG data.

The toolbox is expandable and its application programming interface (API) is built such that newly-derived PWV-BP models can be easily included. The toolbox also includes a user-friendly GUI offering visualization for step-by-step processing of physiological signals, position of characteristic points, pulse arrival time (PAT)/pulse transit time (PTT) values, and the BP regression results.

**Market Applications:**

- Applications with the need of processing the physiological signals
- Applications on estimating bold pressure from physiological signals

**Advantages:**

- First comprehensive toolbox that enables users to optimize their model by considering several factors along the process for obtaining the most accurate model for cuff-less BP estimation
- Reduced time and workload for entire process
- Expandable for adding new PWV-BP models
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