Effective PPG Sensor Placement for Reflected Red and Green light, and Infrared Wristband-type Photoplethysmography

SeungMin Lee*,**, HyunSoon Shin**, ChanYoung Hahm**

* Computer Software, UST (University of Science and Technology),Korea

** ETRI(Electronics and Telecommunications Research Institute), Korea

mr.engineer@etri.re.kr, hsshin@etri.re.kr, cyhahm@etri.re.kr

***Abstract*— Using a wristband-type Photoplethymography (PPG) sensor, useful biomedical information such as heart rate and oxygen saturation can be acquired. Most wrist-type PPG sensors that are used commercially uses green light reflections for its greater absorptivity for hemoglobin compared to other lights; this is important because wrists have comparably low concentration of blood flow. For reliable biomedical signal processing, we propose new measurement sites for reflected red, green, infrared light PPG sensors on wrist. Amplitude, detection rate, and accuracy of heart rate are compared to determine the signal quality on measurement sites. Traditionally, wrist-type PPG sensors are implemented in measurement site 2, 3 or between 2 and 3 (between the distal Radius and the head of Ulna). Experiments show that all three reflected light PPG sensors generate good quality of PPG signals on measurement sites 4 and 11 (around the distal of Radius of left hand) in test subjects.**

Keyword*— *Sensor placement, Measurement sites, Photoplethysmography, Wearable sensors, Wristband-type PPG

SeungMin Lee received the B.S. degree in Electrical engineering with biomedical option from the University of British Columbia in 2013 BC, Canada. He is currently working towards his M.S. degree in Computer software at the University of Science and Technology (UST) in Electronics and Telecommunication Research Institute (ETRI) campus, South Korea. His research interests are in the area of emotion recognition algorithm, bio-signal & emotion-signal processing, and wearable devices.

.