

***Category (please select)** Presenter only Author (I am submitting an abstract temporarily, I will send a full paper subsequently, which needs to be published in this conference)

The Study of Non-Invasive Blood Information Measurement and Monitoring Method via Wearable MWPPG device

Chi Fu Chung¹, Xiang Jun Chang¹, Po Wen Lu^{2*}, Cheng Chun Chang^{1*}

¹ National Taipei University of Technology. No.1, Sec. 3, Zhongxiao E. Rd., Da'an District Taipei City, 10608, Taiwan.

² Taipei Medical University. No.250, Wuxing St., Xinyi Dist., Taipei City 110, Taiwan.

* Corresponding author. Tel.: +886 2 2771 2171#2195; email: ccchang@ntut.edu.tw

Abstract—In recent years, with the proliferation of wearable devices, wearable watches and wristbands capable of detecting physiological information have been considered indispensable tools of modern civilization. These wearable devices enable individuals to monitor real-time physiological data such as heart rate, blood pressure, and blood oxygen concentration to maintain their health. However, there is currently no non-invasive method available on the market for measuring blood-related information within the human body.

Therefore, this study aims to investigate whether wearable devices can provide a non-invasive means of acquiring blood-related information through related signal processing algorithms and neural network models. The research is divided into three main components: the development of a non-invasive wearable device, the collection of blood information in a clinical setting, and the exploration of one-dimensional signal algorithm models.

Currently, we have collected blood-related data at the hospital using our self-developed MWPPG measurement device. We have also trained artificial intelligence models for various blood parameters. The accuracy rate for blood glucose is seventy percent, while for hemoglobin, platelet count, sodium ion concentration, calcium ion concentration, and total protein content, the accuracy rate is approximately sixty to seventy percent.

Key words: Wearable Devices, Non-Invasive Sensing System, Neural Network Model

Authors' Information

Your Name	Title*	Research Field	Homepage
Chi Fu, Chung	Master Student	Medical Engineering, Artificial Intelligence	None
Xiang Jun, Zhang	Master Student	Medical Engineering, Artificial Intelligence	None
Po Wen, Lu	Doctor	Gastroenterology and Endoscopy, Medical Engineering,	https://shh.tmu.edu.tw/page/TeamDocDetail.aspx?deptCode=AA&docCode=19617
Cheng Chun, Chang	Associate Professor	Signal Processing (Spectrum sensor signal processing, Communication signal processing, Biomedical signal processing, Sound signal processing), Mobile/Embedded Systems, Ai/Machine Learning	https://www.ee.ntut.edu.tw/English/teacher/teacher2.php?tsn=73

*This form helps us to understand your research better, and the form itself will not be made public.

*Title can be chosen from: Master Student, PhD Candidate, Doctor, Assistant Professor, Lecturer, Senior Lecturer, Associate Professor, Full Professor, Researcher, Senior Researcher, and others