

The development of new methods for non-invasive blood pressure (BP) monitoring is nowadays moving towards accessible and inexpensive cuffless devices. This paper presents an experimental cuff-less measurement of BP using a smartphone. A photoplethysmographic (PPG) signal measured by a smartphone camera is used to estimate continuous BP. Reference continuous BP was captured using Finapres NOVA device based on Penaz principle. This paper verifies the effect of input data personalization on the accuracy of BP estimation using 1D U-Net. Personalization consists in adding the information about age, gender, weight and height of the subject to the PPG signal. The study involves 56 measured subjects. The output of U-Net is continuous BP waveform, which accuracy is compared with reference using Mean Absolute Error (MAE). Personalized approach shows better results MAE = 8.28 ± 6.29 mmHg than non-personalized approach with raw PPGs inputs where MAE = 10.06 ± 7.12 mmHg. In the subsequent estimation of systolic BP for the personalized U-Net input, the MAE was 8.45 ± 5.21 mmHg, and in the estimation of diastolic BP, the MAE was 6.13 ± 4.61 mmHg. MAE is strongly influenced by the quality of red and green PPGs. The difference in our results compared to other papers reported in the paper may be due to the different number of subjects in the study and also because other authors used only high-quality PPGs to estimate BP. The contribution of our work is the measurement on healthy subjects compared with other authors who used data from patients in the intensive care unit, where BP can be affected by many factors and the patient is not moving throughout the measurement. Another benefit is the use of personalization that is independent of the measurement. Calibration is often understood as the delivery of oscillometric BP. Based on our study to date, this BP estimation seems promising for the future.