

Long-Term Measurement of Physiological Parameters – Child Dataset

Małgorzata Szczerska^{1*}

¹ Department of Metrology and Optoelectronics, Faculty of Electronics, Telecommunications and Informatics, Gdańsk University of Technology, (11/12 Gabriela Narutowicza Street, Gdańsk, Poland)

* Correspondence author: malszcze@pg.edu.pl; ORCID: 0000-0003-4628-6158

Abstract

The dataset titled “Long-term measurement of physiological parameters – child is one dataset” of the bigger series named Long-term measurement of physiological parameters. The dataset contains physiological parameter measurements such as skin temperature and resistance, blood pulse, as well as the stress detection marker, which can have a value of 0 when there is no stress detected or 1 when stress appeared. Additionally, the dataset contains information about the value of the device battery charge. The measurements were conducted for a long period of 120 minutes.

Keywords: temperature measurement; blood pressure measurement; skin resistance

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Specification table (data records)

Subject area	Metrology, Electronics, Sensors, Biomedical engineering
More specific subject area	Physiological parameters measurements
Type of data	Text
How the data was acquired	The data was collected at the Gdańsk University of Technology by the use of a dedicated measurement setup consisting of a heart rate sensor, a skin resistance sensor, an accelerometer, and an infrared thermometer.
Data format	Text document in .log format.
Experimental factors	The data contained in the dataset were not processed.

Experimental features	The measurement setup consisted of: a Plethysmographic heart rate sensor BH1790GLC from ROHM Semiconductor, a skin resistance sensor, accelerometer LSM6DSL from STMicroelectronics, a skin thermometer (infrared radiation sensor) MLX90615 from Melexis
Data source location	MOST Wiedzy Open Research Data Catalog, Gdańsk University of Technology, Gdańsk, Poland
Data accessibility	The dataset is accessible and is publicly and freely available for any research or educational purposes

Background

In the case of neuro-diverse children (such as autism spectrum disorder (ASD)), one of the most important things which has an influence on the efficiency of therapy is a low level of the child's stress (Jędrzejewska-Szczerska et al., 2015). However, the main difficulty in such a process is the inability of the teacher or child to recognise such stressful situations. This is because, on the one hand, ASD children find it very difficult to recognise their own emotions, and on the other hand, they do not use body language, which makes it impossible for the teacher to recognise their pupil's emotions. Therefore, many research groups focus on emotion recognition research to improve interaction with ASD children (Landowska A. et al, 2014; Kołakowska et al., 2017; Tomaczak et al., 2018). The main challenge in such an activity is to correctly measure the physiological parameters of the child and to correlate the changes in the measurand value with emotion changes. The measurements have to be carried out as long-term and real-time measurements. Furthermore, the measurement devices must be designed in such a way that they can be accepted by the person with high sensory sensitivity. As a consequence, many devices are dedicated and personalised equipment.

The dataset, Long-term measurement of physiological parameters - child, provides the possibility for other researchers and engineers to compare and validate their measurement devices and measurement procedures.

Methods

The measurements were carried out by the use of a dedicated measurement setup, which consists of the wearable bracelet with sensors, charger and dedicated software (Fig. 10.1).



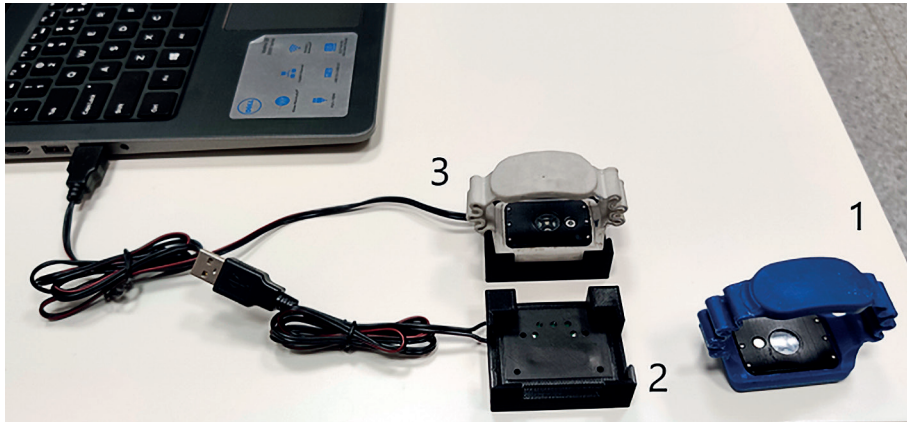


Fig. 10.1. Measurement setup: 1 – wearable bracelet with sensors, 2 – charger, 3 – data transfer

The measurement setup consists of a BH1790GLC heart rate sensor (ROHM Semiconductor), a skin resistance sensor, an LSM6DSL accelerometer (STMicroelectronics), and an MLX90615 skin thermometer (infrared radiation sensor) (Melexis). The main part of the device is an embedded system built around a PSoC6 system-on-a-chip integrated circuit from Cypress. The system and the algorithms used to detect the stressful situation were described in detail by Tomczak (Tomczak et al., 2020).

Data quality and availability

This dataset can be used by other research groups to validate their measurement process and to compare their algorithms which are used to recognise stressful situations based on a change of the values of physiological parameters.

Dataset DOI

[10.34808/x75s-2h03](https://doi.org/10.34808/x75s-2h03)

Dataset License

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