

Minutes of SP4LIFE Workshop 5

Ohrid, September 24 - 26, 2023

Host: Faculty of Computer Science and Engineering (FCSE), prof. Ana Madevska Bogdanova

Attendees:

From Slovakia: Dr. Milan Tysler, Richard Bagín
From Serbia: Dr. Marko Spasenović, Teodora Vićentić, Stefan Ilić, Miona Tomić
From Belgium: Prof. Carlo Iorio, Dr. Immacolata Greco, Valerie Tommen
From N. Macedonia: Prof. Ana Madevska Bogdanova, Prof. Nevena Ackovska, prof. Vladimir Trajkovikj (online), prof. Katerina Zdravkova (online), Assoc. Prof. Bojana Koteska, Assoc. Prof. Magdalena Kostoska, Ivan Kuzmanov, Teodora Mladenovska

24-th September

All the participants have arrived in Ohrid, hotel Tino/Pela and the Co-directors had a meeting to discuss the WS5 agenda in the following days, together with the activities of the 15-th ICT Innovations conference (opening and invited lecturer): <https://ictinnovations.org>. The young researchers Richard Bagín, Assoc. Prof. Bojana Koteska and Assoc. Prof. Magdalena Kostoska continued to work on the Bluetooth Low Energy (BLE) connection between the patch and the Android tablet.

25-th September

9.30 – 11.30 was held the morning part of the WS5.

Prof. Ana Madevska Bogdanova, the FCSE coordinator and Co-director, greeted the WS5 participants and introduced the activities for the rest of the WS5. All the co-directors presented the M4 achievements and the M5 (plans): Marko Spasenović, Carlo Saverio Iorio, Milan Tysler and Ana Madevska Bogdanova. Immacolata Greco from the ULB team introduced the possibility of wrapping the final version of the SP4LIFE patch with a biocompatible material that will hold the whole electronic and battery. Prof. Tysler presented the latest version of the smart patch electronics, with integrated ECG and PPG sensors with the possibility of attaching the graphene breathing sensor and body temperature sensor.

12:00-13:45 Young researcher contributions in M4 were presented at the Conference session as accepted papers for the SP4LIFE papers at the ICT conference. The presenters were:

Ivan Kuzmanov: Ivan Kuzmanov, Nevena Ackovska, Fedor Lehocki, Ana Madevska Bogdanova
“Implementation of the Time Series and the Convolutional Vision Transformers for Biological Signal Processing - Blood Pressure Estimation from Photoplethysmogram”, Springer;

Magdalena Kostoska: Magdalena Kostoska, Ivan Kuzmanov, Bojana Koteska, Fedor Lehocki, Ana Madevska Bogdanova “Processing MIMIC-III for Evaluation of Various Blood Pressure Estimation Models”, Web proceedings;

Ana Madevska Bogdanova (on behalf of Fedor Lehocki): Barbora Andrášikova, Ana Madevska Bogdanova, Milan Tyšler, Magdalena Kostoska, Ivan Kuzmanov, Vladiir Trajkovik, Oto



Masar, Silvia Puteková and Fedor Lehocki, “Using Cuffless Methods for Blood Pressure Estimation Without Need for Individual Calibration”, Web proceedings;

Miona Tomić: Miona Tomić, Stefan Ilić, Teodora Vićentić and Marko Spasenović, “Development of an ECG system based on the ADS1194 integrated circuit”, Web proceedings.

15:30 – 16.45 Hybrid part of the meeting was held online via ZOOM video-conference and onsite with the WS5 attendees. Several presentations were held by all the groups, about the latest developments in the research according to the WPs for the M4 period:

- LIG: latest development – Stefan Ilić and Teodora Vićentić
- Journal paper contributions – Bojana Koteska
- Pipelining presentation – from patch to Tablet – Richard Bagin and Magdalena Kostoska
- Electronic triage – Fedor Lehocki.

The pipelining presentation was of great importance since for the first time the connection from the smart patch to the Android tablet via Bluetooth with the working application (containing the AI model for BP and SPO2 estimation) was presented, showing that the prototype SP4LIFE system is close to its final form.

Prof. Ana Madevska Bogdanova summarized the results and emphasized the future tasks.

26 September

All the participants had fruitful Discussions about the future tasks/timeline for future workshops and promoting the results of the project.

The next (last) workshop is scheduled to take place at the conclusion of M5 period, coinciding with the project's end, in Brussels. However, it is dependent on Dr. Eyup Turmus providing information regarding his availability (Carlo Iorio will contact Dr. Turmus).

Another topic that was discussed was the patenting of the SP4LIFE solution (the electronics with graphene and biocompatible material as a ‘wrapper’, with the software solution for transferring the signals (ECG+PPG+LIG) from the patch to the Android tablet (the application with an interface for showing the parameters HR, RR, BP and SPO2. BP and SPO2 are estimated with AI models, embedded in the application). Carlo Iorio will initiate a meeting for the Patent process, at the end of October 2023.

All the co-directors must terminate the underspending till the end of the project (March 2024).

Joint applications for follow-up funding were discussed among all the partners.

Minutes: Ana Madevska Bogdanova