Analysis of ECG recordings using machine learning methods and artificial intelligence

The joint team of the Košice IT company VSL Software, a.s. and the Faculty of Science at Pavol Jozef Šafárik University in Košice won 2nd place in the international competition in the analysis of ECG recordings using machine learning methods and artificial intelligence.

On March 20, 2021, the fourth year of the international competition for the analysis of ECG recordings using machine learning and artificial intelligence methods was announced. The aim of this challenge was to design and develop the algorithms for the detection of paroxysmal atrial fibrillation from dynamic ECG recordings.

Atrial fibrillation is a type of cardiac arrhythmia that can be asymptomatic in patients and is difficult to diagnose in specific cases. The task of the teams in the announced competition was to design an artificial intelligence model for the classification of ECG recordings into three categories: ECG recording without atrial fibrillation, recording with permanent atrial fibrillation and recording with paroxysmal atrial fibrillation. In the case of the latter category, it was also necessary to predict the accurate onset and the end of each episode of atrial fibrillation in the ECG recording. These solutions can help cardiologists in the time-consuming evaluation of long-term ECG recording and lead to new applications in the field of telemedicine.

The competition was evaluated in several phases, with the online final evaluation being part of the 10th International Conference on Biomedical Engineering and Biotechnology (ICBEB 2021), organized by Nanjing Southeastern University in China from 15 to 18 November 2021.

The Košice team CeZIS, represented by researchers from VSL Software, a.s., Košice, the Institute of Computer Science and the Institute of Mathematical Sciences at Faculty of Science at Pavol Jozef Šafárik University in Košice, took 2nd place in the competition of Asian and European teams. The winner of the competition was team from the University of Shanghai in China. The team from the University of Athens took 3rd place.