

IOT IMPLEMENTATION OF A SNORING SOUND DETECTOR

Heleen Cauwels, Jari Debeer, Jelle Ophals, Michaël Braem, Paul Devos

Ghent University
Department of Information Technology
Research group WAVES
Tech Lane Ghent Science Park, 15, B-9058 Gent, Belgium
p.devos@ugent.be

Medical instrumentation strongly benefits from technological breakthroughs and market evolutions of the ICT sector. The current focus on connected devices, machines, sensors, ... of the Internet of Things (IoT) has resulted in performant platforms of embedded systems with appealing connectivity options, high processing capabilities and supported by an active application developer community. Based on the Raspberry Pi (RPI) IoT platform a prototype snoring sound detector was realized in this study. Using a HiFi quality add-on sound card sounds were recorded for analysis and identification. Using a moving maximum envelope processing the recorded sounds were segmented into snoring events. After digital bandpass filtering the snoring events were analysed using a 200 ms frame based crest factor analysis. This factor is known to differentiate between palatal and non-palatal snoring, and results in a first type of identification. Further processing using short time Fourier transform can reveal the spectral pattern of the snoring sounds with their dominant formant frequencies. The connectivity of the RPi allows integration of such snoring sound detector in e-health systems. In addition it can be targeted to improve the reliability of home sleeping studies, acting as a device to support participatory medicine. For this purpose a webserver functionality on the detector was implemented, making direct data access for the different participating health professionals possible.

PeV C 12

Cherishing



Cross fertilizing worlds

August 30th—September 1st, 2017

Ghent, Belgium