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Non-invasive respiratory sound analysis and monitor system for tracheostomy using convolutional neural networks

Nai Yun Tung
National Taiwan University, Taiwan

The respiratory monitor healthcare system has attracted considerable attention for many years. Owning the fact that chronic respiratory illnesses is observed to increase gradually, relying only on X-ray imaging or CT imaging are not enough to diagnose completely. Before digital recording technology showed up, physicians used stethoscope for clinical diagnosis. The signal cannot be saved, detection by human also gives amounts of incorrectness. Artificial intelligence in clinical diagnosis has become more and more important. Modern breath sound analysis is focused on digital sound processing and graphic representation of the signals. Therefore, this research is aimed at investigating the breath sound analysis of tracheostomy patients, using computational skills and algorithms for classification. In this paper, sound detection module sensor to record sputum sounds from tracheotomy patients, pre-process the signal and analyze curated sounds by artificial and convolutional neural networks is used. Finally, a non-contact, real-time detection system with graphical user interface is built to detect if the tracheostomy patients need sputum drawing and accordingly inform medical personnel immediately.

r06945015@ntu.edu.tw

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