

Digitally Listening to Sound of Lungs



Two different devices aimed at improving the quality of auscultation, the action of listening to sounds from the body, lungs in particular, have been recently presented to the medical community. One is a lung sound recording system (LSRS) from TU Graz and the other is a digital stethoscope from John Hopkins' James West.

Prototype from TU Graz

A research team at TU Graz in Austria [has developed](#) a prototype of a device that records and analyses pathological lung sounds. The researchers hope that this device could be useful for early-stage diagnostics of COVID-19 and other infections, and are now looking to obtain records of COVID-19-positive persons in clinical treatment.

The sounds human bodies make and the changes in those sounds may be indicative of illness. The research team, led by Franz Pernkopf from the Institute of Signal Processing and Speech Communication, has been recording these sounds, of the lung in this particular case, and developing computer-aided analysis methods to assist with medical diagnosis.

You might also like: [Wearables Data for COVID-19 Detection](#)

Traditional assessment of lung sounds with a stethoscope does not always provide the needed level of precision. The sounds are short-lived, cannot be easily picked up by the human ear, and their assessment depends on a particular staff's expertise. In addition, continuous monitoring with a stethoscope is problematic.



The TU Graz's prototype addresses the issues mentioned above providing high-quality recordings of lung sounds and thus making the assessment of pathologies more objective.

"The lung sound recording system (LSRS) is multi-channel and equipped with very powerful micro-electromechanical microphones (MEMS). The recording of lung sounds is non-invasive; the patient simply lies on the device in the supine position," says Pernkopf. The recorded data are then subjected to a computer-aided automatic lung sound analysis. "Our primary focus is on the pulmonary sounds associated with pneumonia, bronchitis, pleurisy, idiopathic pulmonary fibrosis and systolic heart failure," notes Pernkopf.

Working to collect more data to train the computer algorithm, the team is collaborating with the Medical and Pharmaceutical University in Ho Chi Min City in Vietnam. Now the group aims to adapt its lung sound recording system (LSRS) for the purposes of COVID-19 diagnostics, and have applied for urgent funding from The Austrian Science Fund (FWF).

Digital Stethoscope

In parallel, at the [179th Meeting](#) of the Acoustical Society of America, James West, research professor of Electrical and Computer Engineering and Mechanical Engineering at *the Johns Hopkins University*, presented an alternative tool for auscultation – a digital stethoscope (West and West 2020). The AI-driven device with active noise suppression "identifies lung abnormalities with accuracy comparable to trained medical personal" (sic) allowing for higher levels of objectivity during diagnostics.

It is noted that the device can help those working in highly populated or noisy settings, as well as in home care of chronic respiratory patients. Because the recordings may be shared virtually, the device can also help with following social distancing rules.

Image credit: [TU Graz](#)

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