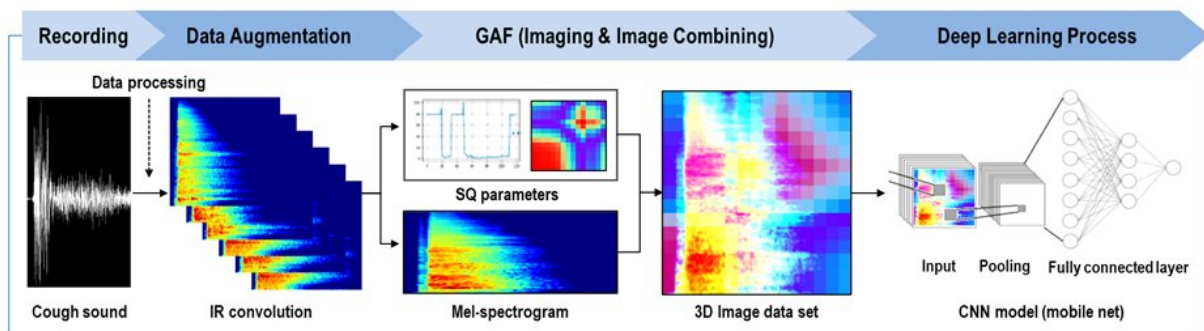# Machine learning diagnoses pneumonia by listening to coughs

December 5 2022

A machine learning algorithm identifies cough sounds and determines whether the subject is suffering from pneumonia. Credit: Jin Yong Jeon

Pneumonia is one of the world's leading causes of death and affects over a million people a year in the United States. The disease disproportionately impacts children, older adults, and hospitalized patients. To give them the greatest chance at recovery, it is crucial to catch and treat it early. Existing diagnosis methods consist of a range of blood tests and chest scans, and a doctor needs to suspect pneumonia before ordering them.

Jin Yong Jeon of Hanyang University will discuss a technique to diagnose pneumonia through passive listening in his session, "Pneumonia diagnosis algorithm based on room impulse responses using cough

sounds." The presentation will take place Dec. 5 at 4:20 p.m. Eastern U.S. in Summit C, as part of the 183rd Meeting of the Acoustical Society of America running Dec. 5-9 at the Grand Hyatt Nashville Hotel.

Jeon and fellow researchers developed a machine learning algorithm to identify cough sounds and determine whether the subject was suffering from pneumonia. Because every room and recording device is different, they augmented their recordings with room impulse responses, which measure how the acoustics of a space react to different sound frequencies. By combining this data with the recorded cough sounds, the algorithm can work in any environment.

"Automatically diagnosing a [health condition](link) through information on coughing sounds that occur continuously during daily life will facilitate non-face-to-face treatment," said Jeon. "It will also be possible to reduce overall medical costs."

Currently, one company has plans to apply this [algorithm](link) for remote patient monitoring. The team is also looking to implement it as an app for in-home care, and they plan to make the experience simpler and more user-friendly.

"Our research team is planning to automate each step-by-step process that is currently performed manually to improve convenience and applicability," said Jeon.

  More information: [acousticalsociety.org/asa-meetings/](link)

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