

Researchers developing coronavirus detection system to screen travelers

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Researchers at Missouri S&T are developing an airborne-biohazard system that could help screeners spot air travelers with lung diseases due to coronavirus and other viruses. Professors in electrical and computer

engineering are using machine learning to build a robust system to alert authorities to airborne biohazards as travelers pass through TSA security checkpoints.

Assistant professor Dr. Jie Huang and visiting professor Dr. Rex E. Gerald II, their lead graduate student Chen Zhu, and assistant research professor Dr. Qingbo Yang are working on the prototype. Dr. Donald Wunsch, who has expertise in artificial intelligence (AI), recently joined the research effort.

"The mission of this lab is to invent [sensors](#) that have ultra-high sensitivity," Huang says. "We are advancing new frontiers in research."

To trigger the airborne-biohazard system, individuals would exhale into a sensor that Huang's team is developing to detect viruses in the breath. If the sensor indicates a virus, the breath would be chemically tagged for further testing in a spectrometer. The researchers say the entire process would take less than a minute and could eventually differentiate between a cold, flu or [coronavirus](#). The research team hopes the system could be made widely available in accessible locations so that people could self-test, similar to blood pressure monitors in retail stores.

"This could provide valuable information to the individual, done in private of course," says Gerald. "We focused on airports first to try to mitigate the impact of canceled flights in the event of a potential pandemic, which could cost billions of dollars to the airline industry."

With each iteration of the prototype device, the research team has provided researchers in other disciplines, such as biology, chemistry, and [medical research](#), with the opportunity to evaluate the evolving design of the sensor system. The team adjusts and modifies the system based on feedback from those evaluations. The researchers say the front-end sensor that would indicate whether someone is sick or healthy could be

ready for [clinical trials](#) in about a year, adding that the full system with chemical tagging and a spectrometer will take significantly longer.

The biohazard sensor showcases the types of research that complement the University of Missouri System's NextGen Precision Health Initiative. NextGen is expected to accelerate medical breakthroughs and improve lives by harnessing the research being done at the system's four universities and training a new generation of health scientists and practitioners.

Provided by Missouri University of Science and Technology

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