

Democratizing health care: There's an app for that

Former ASU professor's patented technology at the heart of FDA-cleared vital sign-checking medical device

By Preesha Kumar , ASU News
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Americans wait an average of [31 days](#) to see a health care provider, a 22% increase since 2022. And while telehealth visits provide cost-effective and accessible alternatives to in-person care, vital sign measurements such as heart rate and respiratory rates are difficult to monitor remotely.

For high-risk patients and those with chronic illnesses, vitals are necessary for managing health, but home monitoring devices can vary in their effectiveness.

[Mindset Medical](#), a Phoenix-based company, seeks to make checking vital signs as easy as scrolling through your phone. The software behind the technology started with an Arizona State University professor and is now making remote monitoring easier.

Solving a \$1,000 health care challenge

Mindset Medical's device platform Vital-Trac enables patients to measure their vital signs on their mobile devices without physical contact. It utilizes remote photoplethysmography (rPPG) to measure fluctuations in blood volume via reflected light to [detect optical changes in the skin](#).

Since the company's rPPG software works with standard cameras, it can be used on a wide range of commercial devices such as phones, laptops and tablets. This allows health care providers to monitor patient health without the need for in-person appointments and is much more affordable compared with traditional medical devices.

"For example, if you have a fever, a physician can say, 'Hey, take two Tylenol and let's see if it comes down and talk to you in 30 minutes.' In about 90% of cases, my heart rate and temperature drop, and I no longer have a fever. Instead of paying to go to an ER or a medical office, we've just solved a \$1,000 health care challenge that exists today," said Mindset Medical CEO Mitch Foster.

The software, which achieved [Food and Drug Administration clearance in June](#) to measure pulse and respiratory rate in patients, has its foundations in an ASU laboratory. Some of the original

concepts were created by ASU Professor Nongjian Tao, who died in 2020.

Collaborating for advancement

Tao was a professor of electrical engineering in the Ira A. Fulton Schools of Engineering and the former director of the [Biodesign Center for Bioelectronics and Biosensors](#) at ASU. His research paved the way for molecular electronics, nanoelectronics, chemical and biological sensors, and wireless devices for mobile health. During his time at ASU, he [founded two companies](#), received 26 patents and published over 350 articles.

Foster met Tao when he presented how to capture a subject's heart rate using a high-end camera. Rick Barber, one of Mindset's early founders, worked closely with Tao, later licensing the rights to use one of Tao's patented technologies.

"Tao ended up patenting elements of remote photoplethysmography — a 'remote' version of PPG technology that is used in wearable devices like smartwatches to capture color changes to estimate pulse rate, respiration and blood pressure," Foster said.

The company also participated in the [Health Care Accelerator program](#), a joint venture with ASU and Mayo Clinic that provides an entrepreneurial curriculum and an expert-led ecosystem to accelerate startup growth.

"The accelerator was critical in giving us significant validation of our concepts to apply to health care for virtual visits, telemedicine, electronic medical record integration, patient portal integration and care pathways. The accelerator was exceptional in providing a significant voice of the customer to help us focus on specific use cases," Foster said.

A legacy of innovation

Tao's innovative thinking and drive for discovery live on in the technologies and companies he helped build. From the scientists he mentored to the patents and papers he published, he made a mark not just on his field, but also on the lives he hoped to change.

[Erica Forzani](#) worked closely with Tao as the deputy director of the Biodesign Center for Bioelectronics and Biosensors, where Tao developed the rPPG technology used in Mindset Medical's app.

"NJ Tao was driven by a vision to make a lasting impact on the world and improve lives through technology," said Forzani, a research professor in the [School for Engineering of Matter, Transport and Energy](#), part of the Fulton Schools at ASU. "He found inspiration in Steve Jobs — particularly in how Jobs revolutionized iPhone models and app functionalities, paving the way for mobile health. This idea of leveraging smartphones to bring accessible health solutions to everyone played a key role in shaping his motivation for developing this technology."

Why this research matters

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Main image



Image of Vital-Trac app on a phone screen. Photo illustration by Jason Drees/ASU