INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

Wearable Pneumatic Ultrasound Imaging Probe for Non-Invasive Continuous and Automated Physiologic Monitoring

TECHNOLOGY NUMBER: 7431

Technology ID
7431

Category
Medical Devices
Life Sciences

Inventor
Bradley Plummer
Chelsea Tafoya
Grant Kruger
Matthew Tafoya
Nikhil Theyyunni
Ross Kessler
Steven Harte
Torben Becker

Further information
Katherine Pollard
kpollar@umich.edu

View online

OVERVIEW

Ultra-low-cost, wearable, autonomous ultrasound sensor for longitudinal data collection

- Operates without user interaction, enhancing convenience and accuracy
- Applies to continuous health monitoring, early disease detection, and wearable diagnostic tools

BACKGROUND

Ultrasound technology has long been a cornerstone of medical imaging, providing non-invasive diagnostic capabilities for a myriad of conditions. Traditional ultrasound systems, however, are often bulky, expensive, and require skilled operators to capture accurate images. These limitations have spurred interest in developing more accessible and user-friendly alternatives. Historically, wearable sensors have emerged as a promising solution, but many still rely on user interaction or suffer from high costs and complexity, which impedes widespread adoption. Additionally, the precise application and consistent orientation of these sensors can be challenging. This situation underscores the need for an improved method that is both user-independent and cost-effective, allowing for more consistent and widespread physiological monitoring, particularly for long-term and preventive healthcare applications.

INNOVATION

Researchers have created a low-cost, wearable ultrasound sensor that autonomously collects data without user interaction. Designed as an air-powered, single-element imaging sensor, it significantly reduces the need for operator intervention once applied correctly to the subject. This sensor's ultra-low-profile and low-cost design positions it as an ideal disposable monitoring device. Furthermore, its versatility allows for the integration of other sensing modalities, providing supplementary physiological measurements. This advancement offers significant technical improvements by enhancing ease of use, reducing costs, and ensuring consistent data collection. Applications include continuous health monitoring, early disease detection, wearable diagnostic tools, and broad deployment in both clinical and home-care settings, thus paving the way for more accessible and preventive healthcare solutions.