

Low-Cost Non-Invasive Handheld Ultrasound Device for Measuring Tissue Stiffness

Technology Description

Vanderbilt University researchers have developed a hand-held device to quantitatively measure tissue stiffness for medical monitoring. This device is non-invasive, low-cost, and can be used at the point of care.

Addressed Need

Human body tissue stiffness is a vital measurement in a variety of medical applications such as skin lesion assessment and liver fibrosis staging. Current methods of measuring tissue stiffness, such as frequent biopsies and high-end ultrasound systems, are invasive, expensive, and labor-intensive. The device described here is non-invasive, inexpensive, and portable, allowing it to be used at the point of care of the patient.

Commercial Applications

- Tissue stiffness assessment for:
 - Shallow pathologies (e.g. skin lesions, wound healing, and skin fibrosis or edema from radiation)
 - Diffuse diseases (e.g. liver fibrosis)
- Assessment of biomaterials during research and quality insurance

Figure 1 (right): By displacing tissue about 10 microns, a unique on-axis displacement signature is created which is then used to determine tissue stiffness.

Unique Features

- Hand-held device can be used at point of care
- Inexpensive compared to current technologies
- Non-invasive method eliminates the need for frequent biopsies

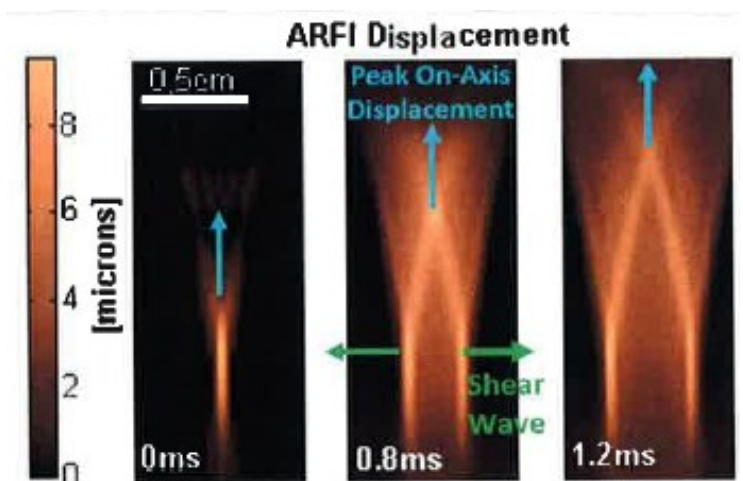
Technology Development Status

- Researchers have successfully prototyped both the physical device and processing algorithm
- Experiments have been conducted to compare the results of the device to traditional methods

Intellectual Property Status

Published US patent application:

<http://patents.google.com/patent/US20160367220A1>



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VU REFERENCE: VU15145

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