

THREE-DIMENSIONAL IMAGING VIA PIEZOELECTRIC MICROMACHINED ULTRASOUND TRANSDUCER

Tech ID: 34297 / UC Case 2026-042-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

Traditional imaging techniques often rely on bulky hardware or complex computational methods to resolve depth. UC Berkeley researchers have developed a three-dimensional imaging system that utilizes piezoelectric micromachined ultrasound transducers to capture high-resolution spatial data with an integrated approach that allows for compact, high-performance imaging that can be used in a variety of environments where traditional optical or radar systems might be limited.

SUGGESTED USES

- »
Medical Diagnostics: Providing low-power, high-resolution three-dimensional ultrasound imaging for point-of-care medical devices.
- »
Biometric Security: Implementing advanced fingerprint or vein recognition systems that use three-dimensional ultrasonic mapping for high-fidelity authentication.
- »
Autonomous Navigation: Enabling small-scale robots or drones to perform three-dimensional obstacle detection and environmental mapping in dark or obscured conditions.
- »
Industrial Inspection: Conducting non-destructive testing and three-dimensional internal imaging of structural components to identify hidden cracks or defects.
- »
Human-Machine Interaction: Developing gesture-recognition interfaces that track hand movements in three-dimensional space for consumer electronics and virtual reality.

ADVANTAGES

- »
Compact Integration
- »
High Resolution: Piezoelectric materials enable the generation and reception of precise signals, resulting in highly detailed image reconstruction.
- »

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INVENTORS

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OTHER INFORMATION

CATEGORIZED AS

- » **Computer**
- » Hardware
- » **Engineering**
- » Engineering
- » **Medical**
- » Devices
- » **Sensors & Instrumentation**
- » Medical
- » Physical Measurement
- » Scientific/Research

RELATED CASES

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Environmentally Robust: Unlike optical sensors, this ultrasonic system can function through smoke, dust, or opaque liquids, making it ideal for challenging environments.

»

Lower Power Consumption: The efficiency of micromachined piezoelectric transducers reduces the energy required for pulse generation compared to traditional bulk ultrasound hardware.

»

Scalable Architecture: The transducer design can be scaled to various array sizes to balance the requirements for imaging speed and spatial detail.

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [PMUT for Blood Pressure Monitoring](#)
- ▶ [PLASMONIC COFFEE-RING PATTERN DIAGNOSTIC DEVICES AND METHODS OF MAKING AND USING THEM](#)
- ▶ [Subcutaneous and Continuous Blood Pressure Monitoring by PMUTS](#)
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