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

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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.

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Autonomous Navigation: Enabling small-scale robots or drones to perform three-dimensional obstacle detection and environmental mapping in dark or obscured conditions.

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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

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Compact Integration

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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

2026-042-0

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

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

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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

- PLASMONIC COFFEE-RING PATTERN DIAGNOSTIC DEVICES AND METHODS OF MAKING AND USING THEM
- Subcutaneous and Continuous Blood Pressure Monitoring by PMUTS
- Reconfigurable Soft Li-Ion Battery
- Fabrication of enhanced supercapacitors using atomic layer deposition of metal oxide on nanostructures
- Wafer Level Chip Scale Packaging Technology For Integrated Mems Devices

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