

Ultrasound Device for Underwater High Resolution Imaging in Turbid Water

Summary

A team of Vanderbilt researchers has developed a novel system for producing 3D, real-time, high-resolution visualization within arms reach of a diver. The system uses a custom ultrasound array and mirror system in conjunction with software and algorithms to overcome the limitations of existing systems, enabling the diver to see through turbid water in real-time.

Addressed Need

Divers perform a broad range of tasks from routine inspections of underwater infrastructure and ship hulls to complex salvage/recovery operations and ships husbandry. Frequently, this work is done in turbid water with little to no visibility. Additional illumination is not effective, as light may only reflect off suspended particles, blinding the diver. Existing underwater imaging systems that utilize infrared or laser light are not effective in turbid water, whereas existing 3D ultrasound systems are too slow and do not provide an adequate depth of field. The Vanderbilt system addresses each of these challenges in a compact form factor.

Unique Features

- ◇ Fast, 3D imaging solution with higher resolution than existing sonar systems
- ◇ Allows divers to “see through” turbid water in real-time
- ◇ Enhanced depth of field compared to existing solutions with the ability to visualize the environment within arms reach of a diver
- ◇ Compact form factor

Technology Development Status

A prototype of the device has been built. Additional testing and refinement is ongoing, including work to reduce the size of the device in order to create a head-mounted system.

Intellectual Property Status

A patent application has been filed.

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