

Ultrasound transducers and reconstruction methods for volumetric imaging

This technology incorporates innovative transducer designs and image reconstruction algorithms, enabling effective 3D/4D imaging in clinical practice without the need for costly, large-scale sensor arrays and application-specific integrated circuits (ASIC).

Proposed use

The proposed ultrasound imaging technology advances clinical ultrasound from 2D to more sophisticated 3D/4D imaging. It provides an economical solution for ultrasound imaging manufacturers, enabling the adoption of 3D/4D technologies across a range of clinical applications. By offering 4D imaging at a much lower hardware complexity and cost, this technology meets the growing market demand for advanced yet accessible diagnostic tools.

Problem addressed

This technology addresses significant challenges in medical ultrasound imaging. Traditionally, diagnostic ultrasound imaging procedures require highly trained sonographers to acquire multiple 2D images, a process that is time-consuming and prone to variations in transducer positioning. Existing 3D/4D technologies are expensive and have low frame rates. This innovation makes 4D imaging more accessible, enabling less trained personnel like nurses to acquire necessary data, thus expanding access to critical diagnostic information. It tackles the limitations of 2D imaging, such as limited information content and quantification accuracy, and difficulty in identifying the correct imaging planes for imaging a 3D structure such as tumour, by offering a more straightforward and less operator-dependent system. This advancement not only enhances diagnostic accuracy and efficiency but also significantly reduces healthcare costs by simplifying the imaging process and minimizing the need for extensive training and large, intricate sensor arrays.

Technology overview

This technology uses existing acquisition hardware and a customised transducer. This approach enhances 4D image quality while simplifying system complexity and reducing expenses. Furthermore, it can be integrated into existing medical practices without requiring substantial equipment upgrades.

Inventor information

Mengxing Tang, Professor of Biomedical Imaging, Faculty of Engineering, Department of Bioengineering.

Joseph Hansen-Shearer, Postdoctoral Research Assistant, Faculty of Engineering, Department of Bioengineering.

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Benefits

- Cost-effective for ultrafast 3D/4D imaging, with cost similar to existing 2D systems.
- Delivers excellent spatial and temporal resolution, enhancing diagnostic clarity.
- Reduces the need for precise manual selection of imaging plane and operator training.
- Compatibility with existing hardware extends its utility to various healthcare settings.
- Suitable for a wide array of clinical diagnostics, expanding the scope of ultrasound use.

Diana Yin

Industry Partnerships and
Commercialisation Executive -
Engineering

Email: d.yin@imperial.ac.uk

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