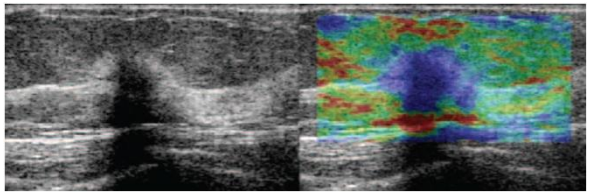
Faculty of Science and Technology
Tokushima University

Biomedical Imaging using Ultrasound

Specially Appointed Professor Makoto Yamakawa

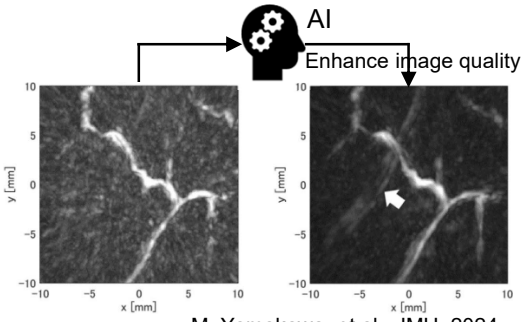
◆ Ultrasound Tissue Elasticity Imaging



Example of breast cancer

A. Ito, et al., Radiology, 2006.

◆ Photoacoustic Imaging

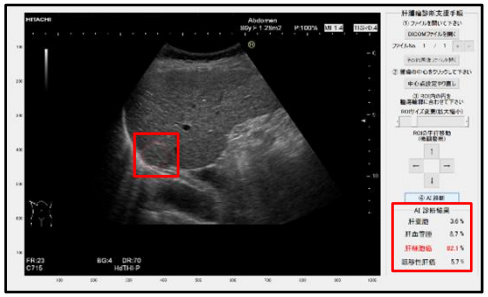


M. Yamakawa, et al., JMU, 2024.

Example of vascular image of the palm

K. Nagae, et al., F1000Research, 2019.

◆ Computer-Aided Diagnosis of Ultrasound Images



Example of CAD for liver tumor

We use **ultrasound**, a safe technology for living tissues, to visualize the following types of biological information:

- Morphological information
- Functional information
- Characteristic information

Our aim is to provide information that is useful for diagnosing diseases and planning surgeries.

＜Examples of our research topics＞

◆ Ultrasound tissue elasticity imaging
(Ultrasound elastography)
- Motion vector estimation
- Tissue viscoelasticity estimation

◆ Photoacoustic imaging
- Expansion of sensor density, aperture, and bandwidth using deep learning

◆ Computer-aided diagnosis of ultrasound images
- Detection and classification of liver and breast tumors using deep learning

Keywords：Ultrasound, Biomedical imaging, Deep Learning

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