

Sensors for Medical care and Agriculture
田原研究室
Tabaru Lab.

Ultrasound and optical sensors

Sensor technologies to apply medical and agricultural fields are researched, combining wave technologies (ultrasound, light) and peripheral technologies.

Agriculture

Softness measurement of fruits

- High-end fruits (human health)
- Reduce farmer's burden



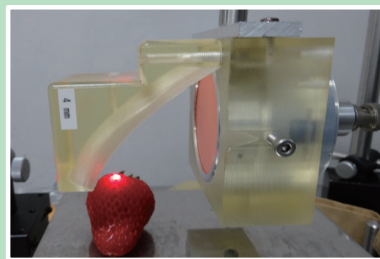
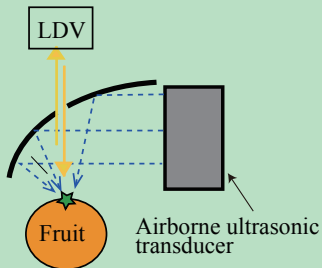
Problem

Test using needle
→ cause damage to fruits

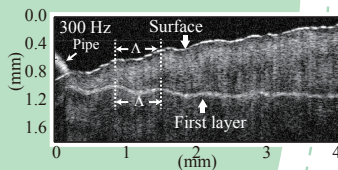
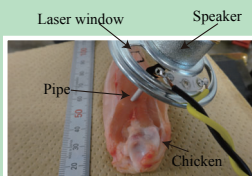
Color, shape, softness are important!

Non-contact method to measure softness of fruits

→ Judgement of harvest time

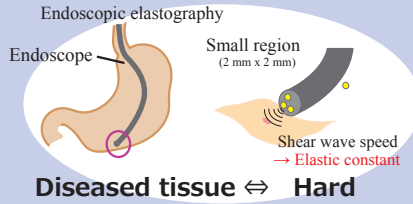


Dairy farming... Non-contact measurement of quality of meat



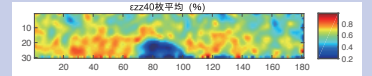
○ Elastography of human tissue

→ Early detection of cancer



Analysis of wave propagation

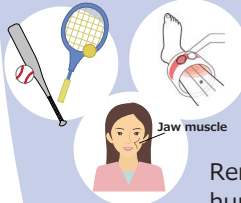
Colormap of hardness



Shape → Quality can be used for diagnosis

○ Fusion imaging (sound & light) $\text{Music} + \text{Light} = ?$ → Novel diagnosis method

○ Real-time monitor of muscle condition using ultrasound



Sports
Physical therapy
Home health care

Problem

Force information is unknown from appearance

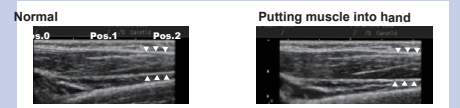
Remote monitoring of human motion



Putting muscle into hand
Unknown in appearance



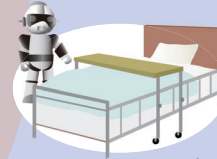
Force information is acquired with ultrasound



High-quality measurement with combination of EMG sensor and ultrasonic sensor

“Flexible sensor”

→ Safe and secure measurement



Detecting the pinching of baby carriage and blind man's eyes

Soft sensor

