

No one left behind:

Automatic Screening of Rare and Neglected Cancer by Medical Image Analysis

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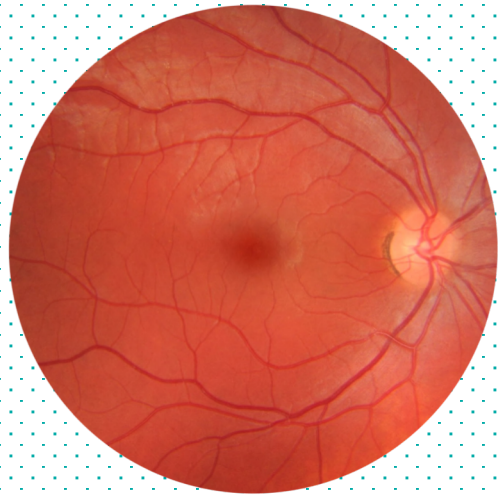
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• Past and Ongoing Research Background

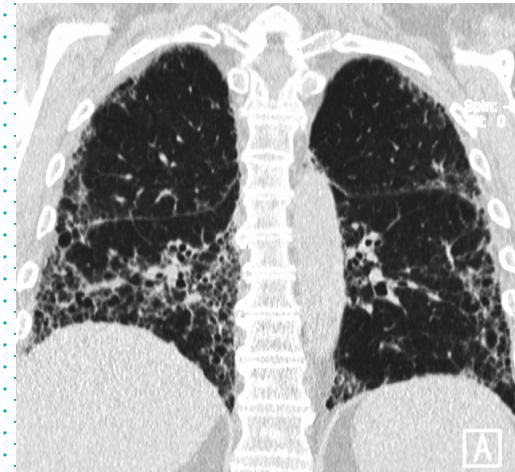
1



Fundus Image

Open-angle glaucoma
Cup-to-disc ratio
ISNT rule

2

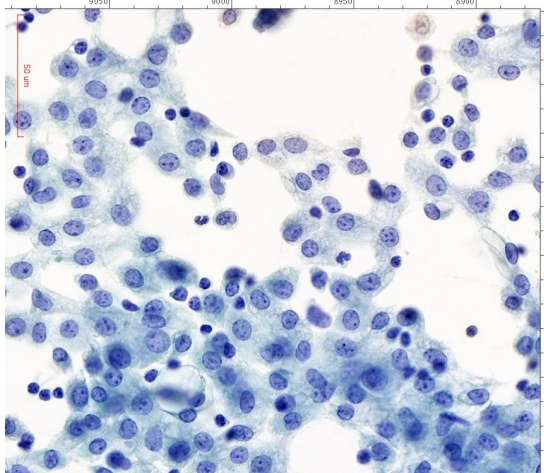


HRCT Lung image

Emphysema
Air-trapping detection
Obstructive and restrictive lung disease

Past and Ongoing Research Background

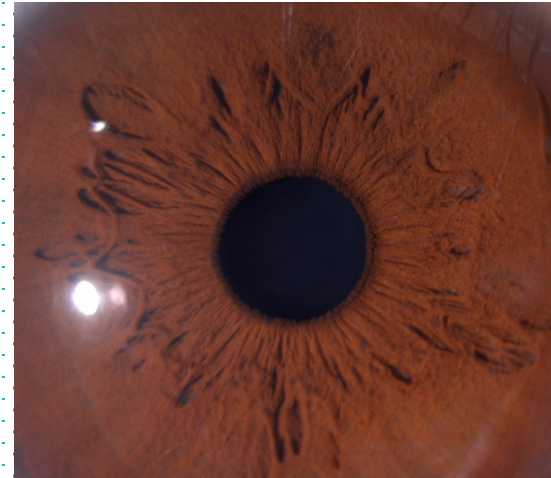
3



Malignant Cells

Specimens
Cancer Cell.

4

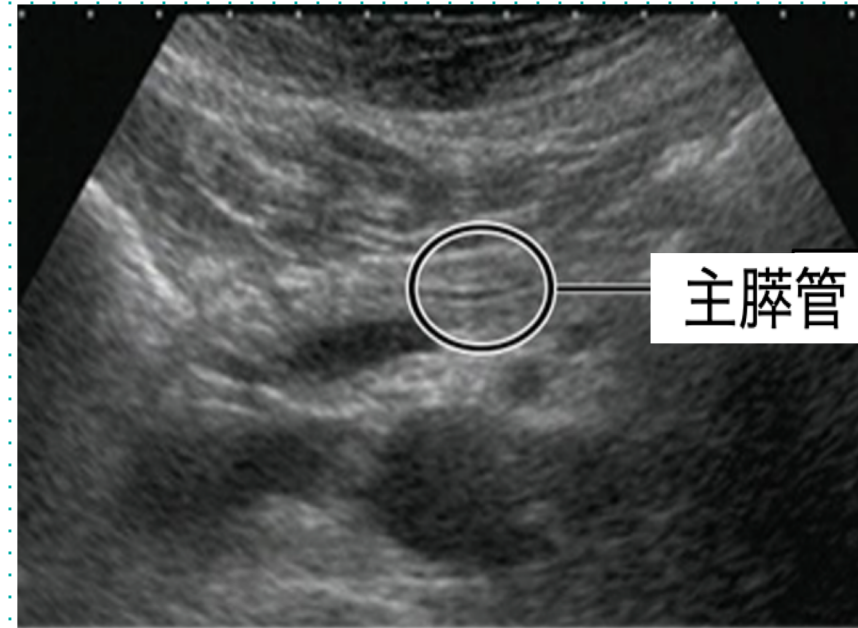
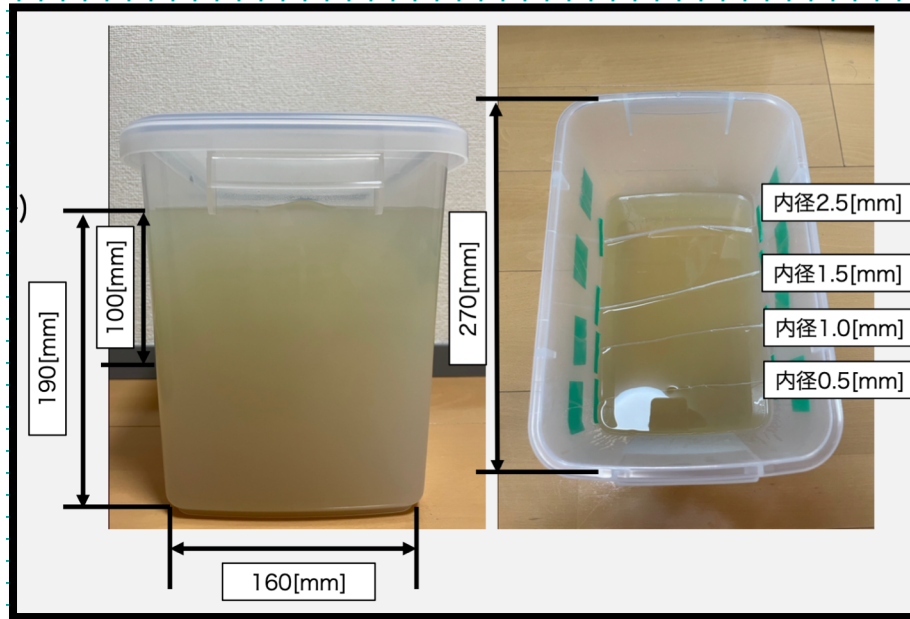


Corneal Tattooing

Slit lamp image
Corneal opacity

Ongoing Research Background

5



A study on region extraction of main pancreatic duct model using deep learning in ultrasound images, Kotani Laboratory, 小林 賢大



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Rare and Neglected Cancer

7th Rank Worldwide

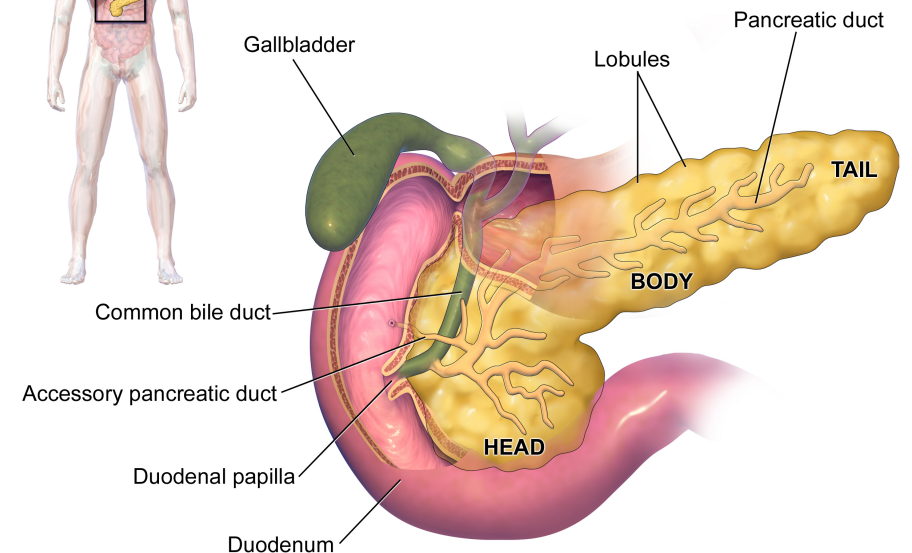
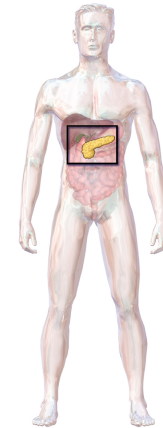
4th Rank in the US.

Thailand,
Mortality rate

99.13%

within 6 months to 5 years

Although the early prognosis of cancer is the key to increase the survival rate of cancer patients, the detection of pancreatic cancers was largely ignored by the medical studies in Southeast Asia countries, due to its challenge to detect by their limitation of equipment in regional medical facilities and lack of medical expertise in the rural areas.



Challenges on EARLY detection.

01 The size is too small.

- less than 1 cm, deep layer

02 No alarm system or early warning sign

- The symptom appears early only when they have an obstruct on the common bile duct [head].

03 Imaging only may not enough.

- Tumor marker
- CT scan, MRI, PET Scan, Abdominal Ultrasound, Endoscopic Ultrasound [EUS], Percutaneous transhepatic cholangiography [PTC], Percutaneous transhepatic cholangiography [PTC], or more.

Our Aim

1. Automatically screen the rare cancers

which were neglected in Southeast Asian countries due to their difficulty to be detected, such as pancreatic cancers, by medical knowledge and advanced image analysis methods.

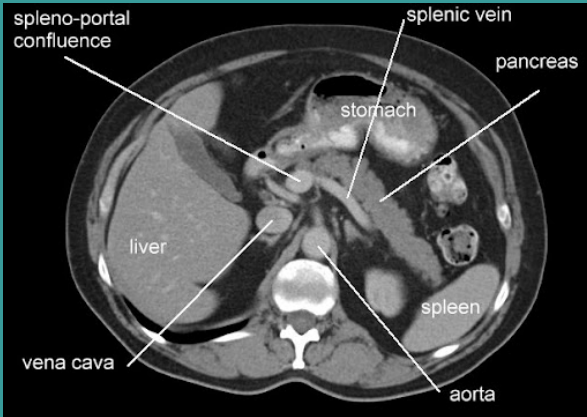
2. Expand the capability of the current diagnosis of rare cancers

Investigate the diverse usages and possible integration of multimodal sensors, such as MRI, CT-Scan, Ultrasound

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Medical Imaging

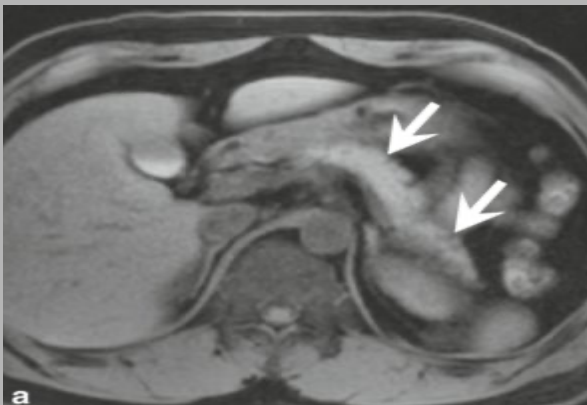


CT-scan

- Pancreatic duct
- Findings of Stoma
- Findings of MPD

EUS

- Pancreatic masses
- Tumor
- Cysts
- Acute and chronic pancreatitis



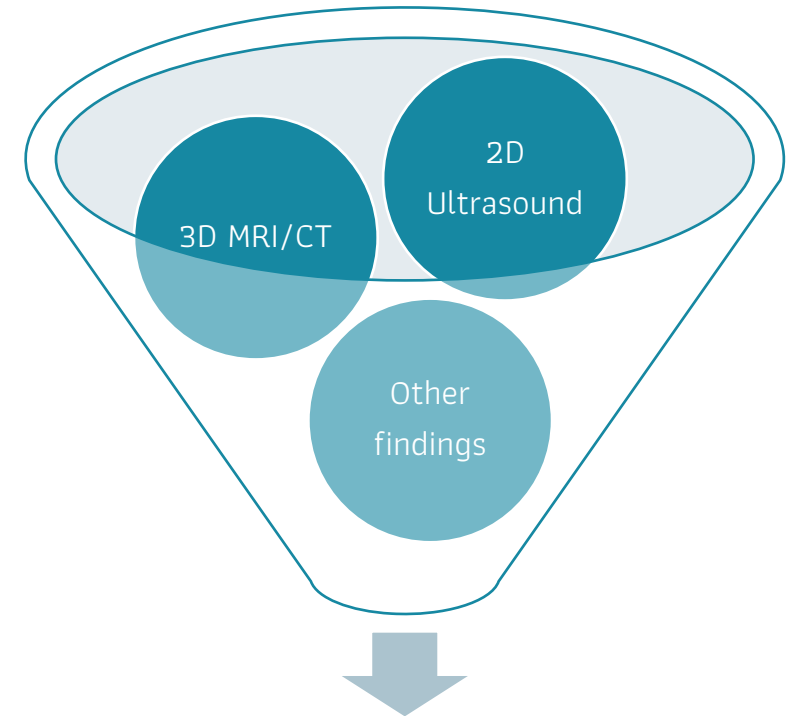
MRI

- Fat-suppressed T1 and T2 weighted MRI
- Does not expose patient to radiation

**Diverse Usages
&
Integration of Multimodal Sensors**

Our Proposed Solution

- To generate Learning model from the shape and motion model from the 3D MRI/CT Image.
- To interpret the hidden pattern from multimodal integration.
- To build a unify platform that can maximize the detection rate under the limited resources in Southeast Asia countries.



Multimodal Integration

Plan for Connected Project

- Medical Image or Signal Theme
- Advanced Medical Image or Data Analysis
- AI Technology
- Healthcare supporting system
- Establish sustainable international relationship between SEA countries

Living to 100 and beyond

