

DIGITAL HEALTHCARE

Digital/Smart Healthcare Solution

- Medical A.I. Software for Early Tumour Detection
- Robotics A.I. Biopsy System for precise Biopsy
- A.I. Pathology & Telepathology
- robotics for Telehealth / Telemedicine solution



Medical Artificial Intelligence Market Analysis

Pathological artificial intelligence

In 2016, there were about 9,000 professional occupational pathologists in China with a gap of 4-9 million. The need for pathological diagnosis increases year by year. The huge market demand requires artificial intelligence to compensate for this imbalance in supply and demand.

The annual demand for cancer diagnosis in China will increase by 35%-50%, and by 2025 there will be a gap of 14,9 pathology/radiology department. Over 60.7% of pathologists are over the age of 55, and the growth rates of radiologists are far below the clinical requirements.

CT image artificial intelligence

Lung cancer in China accounts for the highest malignant tumors and deaths. The chest radiograph technique is an effective screening of lung cancer. Because low-dose CT is more accurate than chest X-ray, it has been widely used in developed countries, but due to the large number of CT scans, the physical examination item of the year with the highest frequency, but due to the large number of CT scans, the diagnosis time. With a large workload, it is inevitable. Artificial intelligence diagnosis can greatly improve the diagnosis

Digital Pathology or Radiology ??

Potential solution to the experts shortage

- Addressable market size: USD979 Million
- CAGR: 11.5% (2016-2011)
- Expert shortage:

2025: 14,900-35,600 shortage of physicians

10.4% decrease in active physicians pathology in 2008 – 2015

60.7% of active physicians in pathology are age 55 or older

Time required delays decision making pathology

	U.S.	China
Pathologists to patients	1:2000	1:70,000
Cancer Growth Rate	-2%	4%
Demand for cancer diagnosis	4%	35-50%
# of pathologists	0-1%	4%

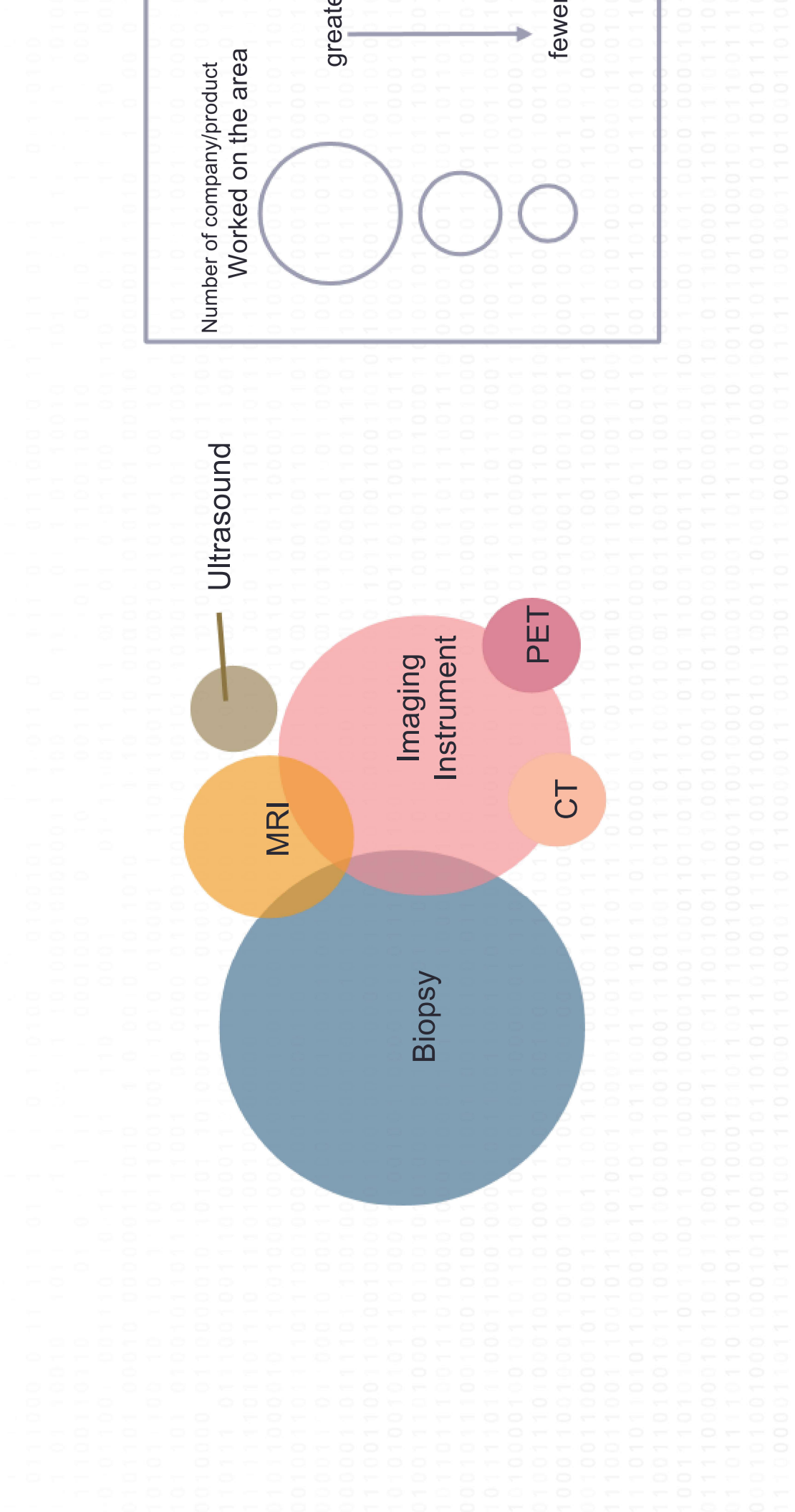
Source:

- World Health Organization -World Cancer Report 2015

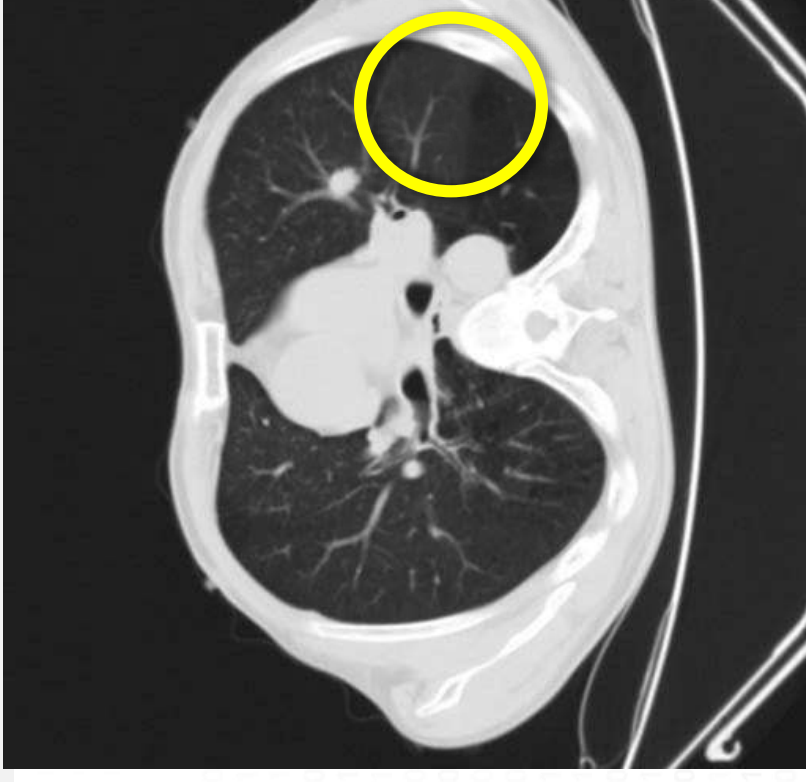
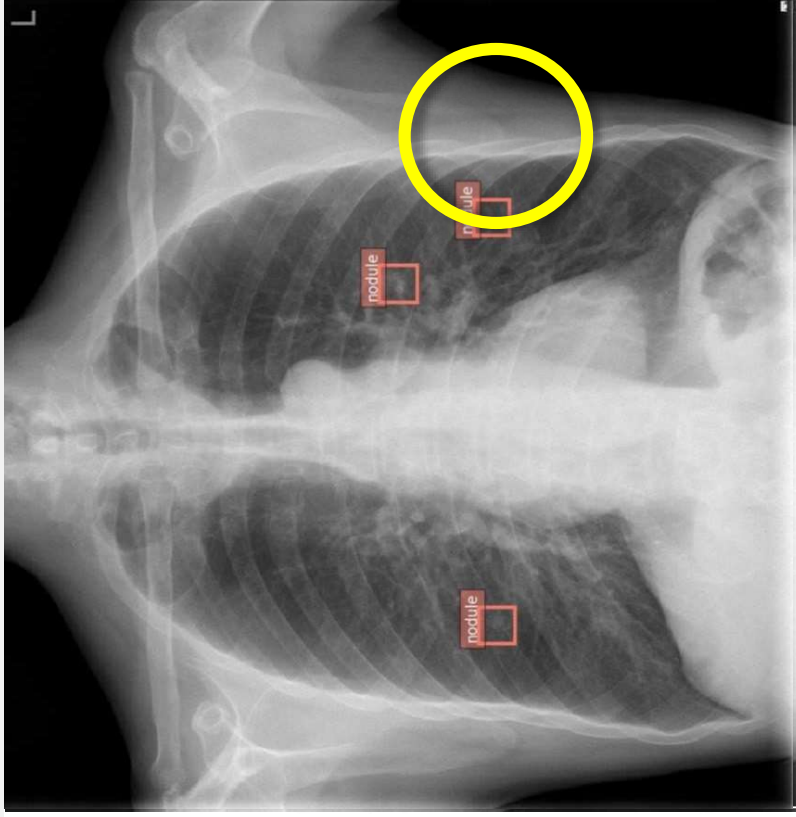
- US figures -AAMC 2015



Digital Diagnostic Market, by product (instrument ba



A.I. for Early Tumor Detection



X-ray report inspection system detects missing lung nodules in the doctor's report. CT scan results show

“A nodules were seen in the anterior segment of the upper lobe of the left lung, with a long diameter of about 1.5 cm. The boundary was clear.”

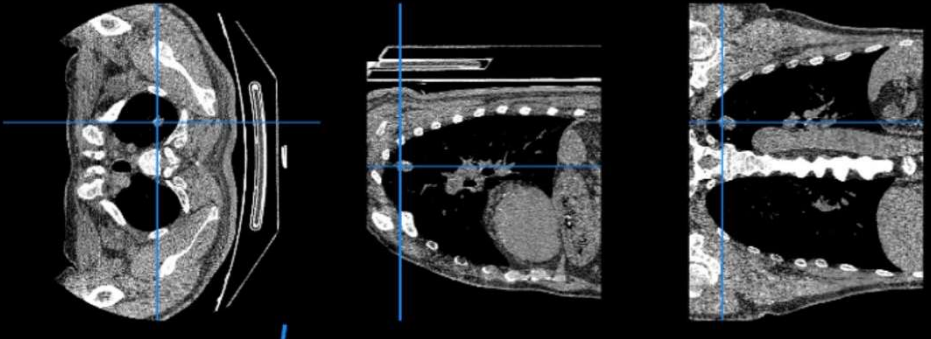
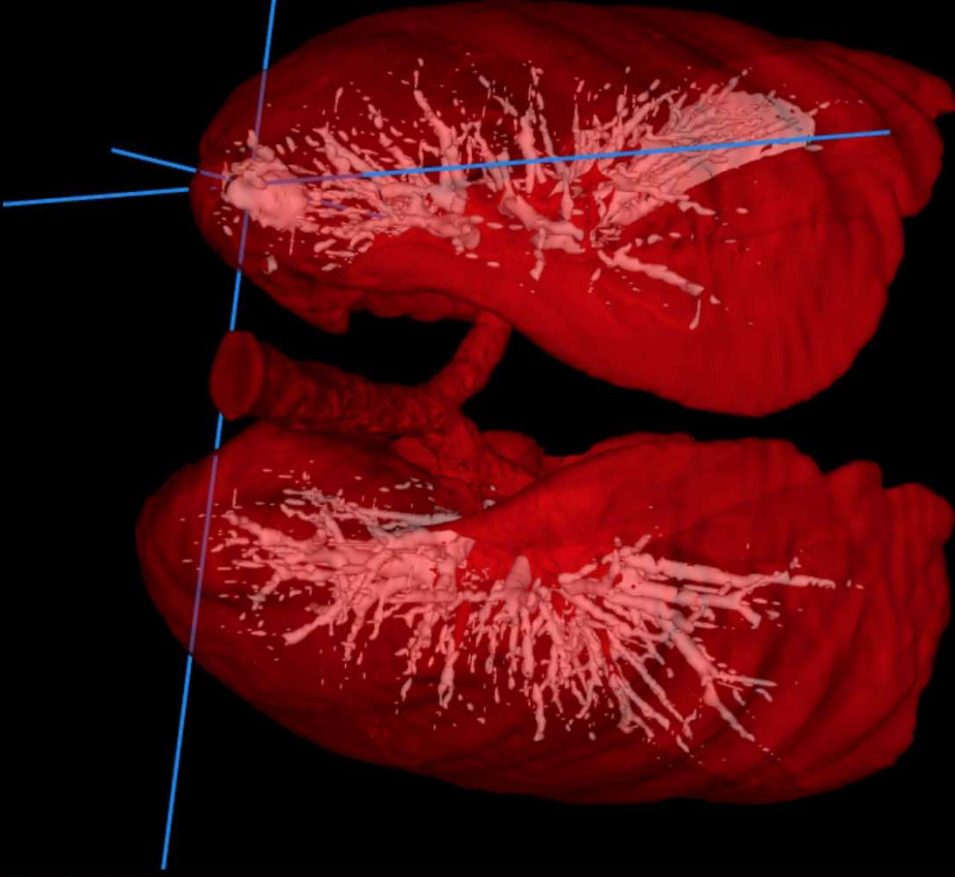
A.I. for Early Tumor Detection

File View Settings Help

Suspicious nodule

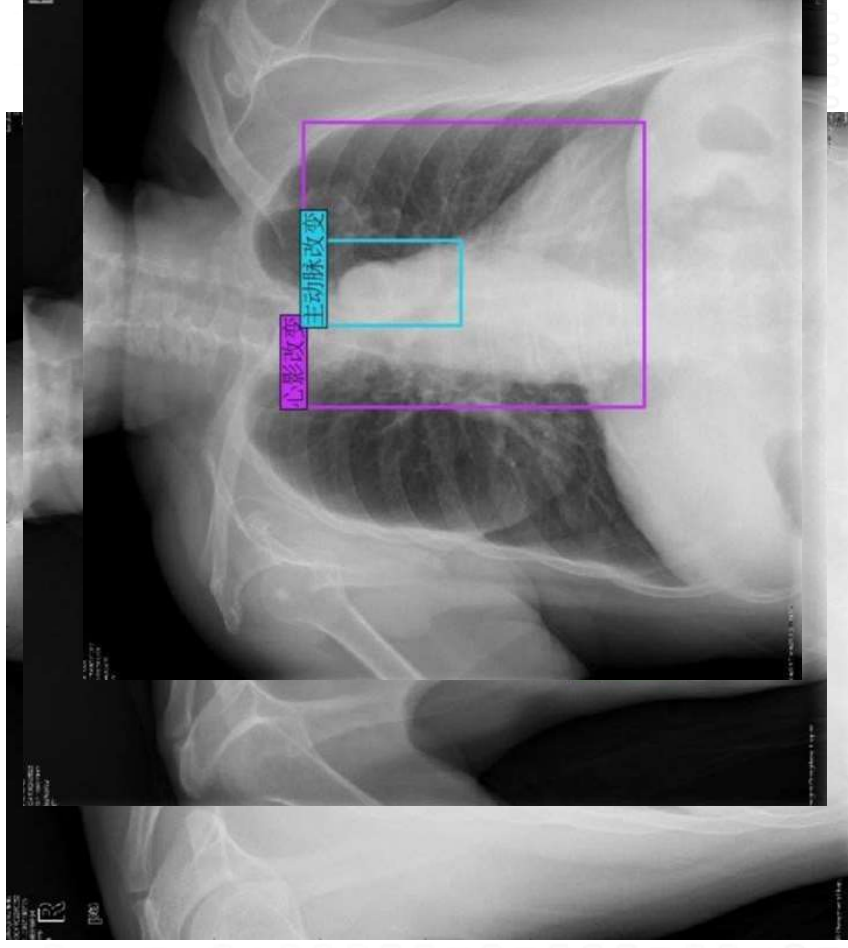
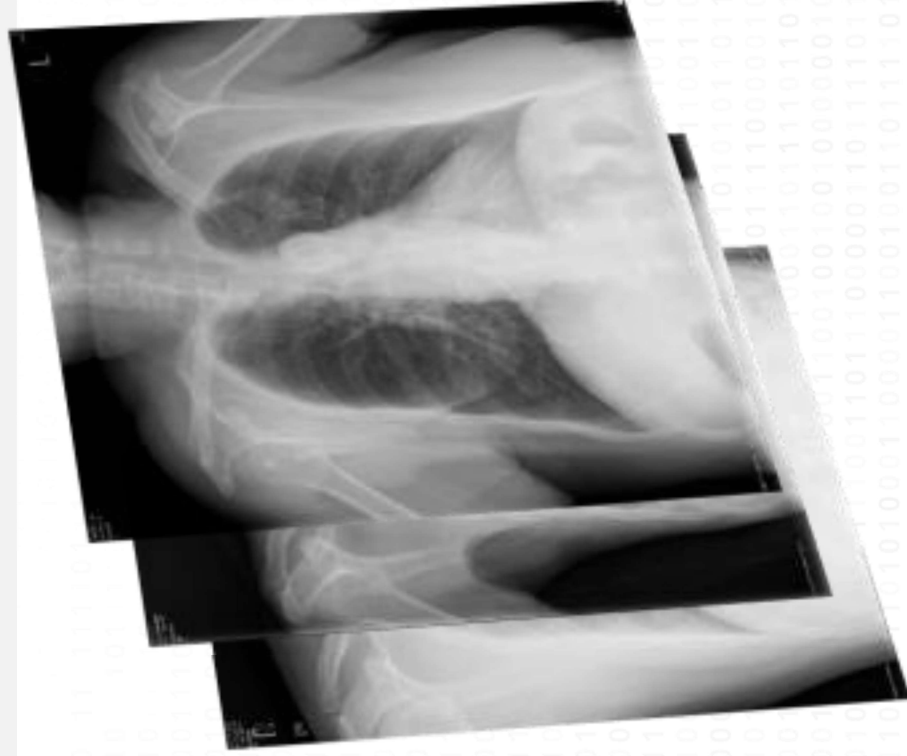
Possibility >=

X	Y	Z	Possibility
-18.70	8.50	-10.79	0.97
-39.53	6.45	-4.29	0.96



“2 nodules are seen in the lung, with a long diameter which can be measure”

Intelligent X-ray screening



The model can detect more than 20 diseases with nodules

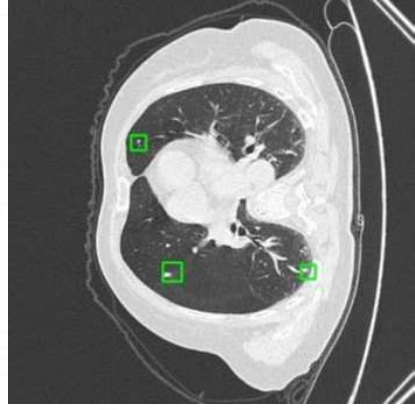
Model analysis time: 0.05s

Model sensitivity: 91%

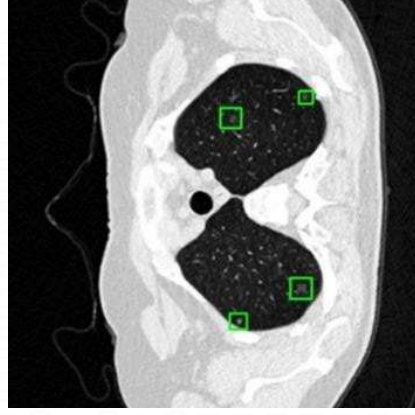
X-ray assisted diagnosis model can quickly identify the lesion images, Lesion location, including 5mm pulmonary (thoracic surgery specialist recommended surgery Thoracic pulmonary nodule size) helps the doctor to increase the efficiency



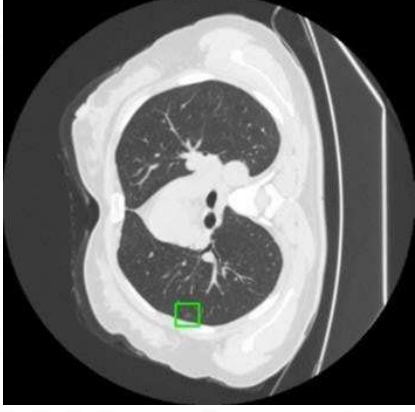
Intelligent CT Assisted Screening



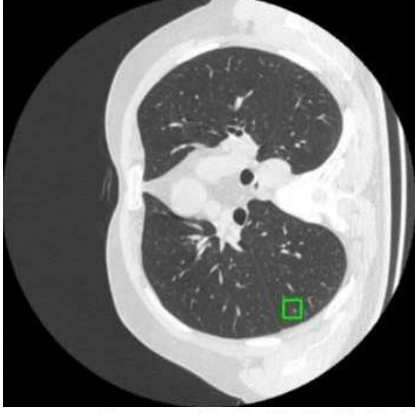
Multiple nodules



Multiple ground glass



Lightly ground glass

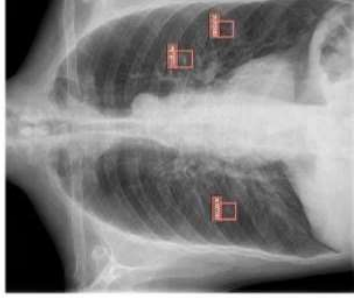
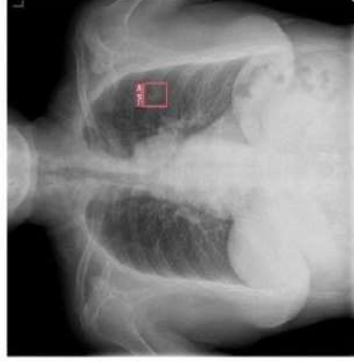


Tiny nodules



Part

CT



X Ray

A.I. Surgical Robotics for Needle Targeting

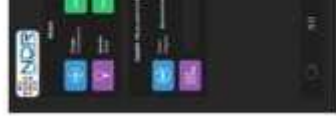
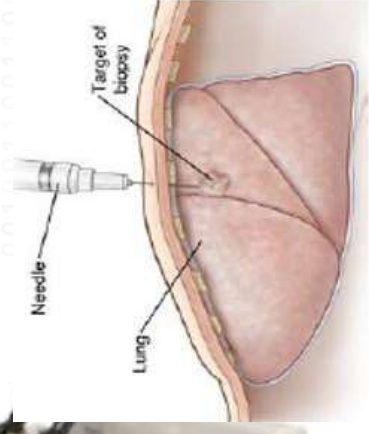
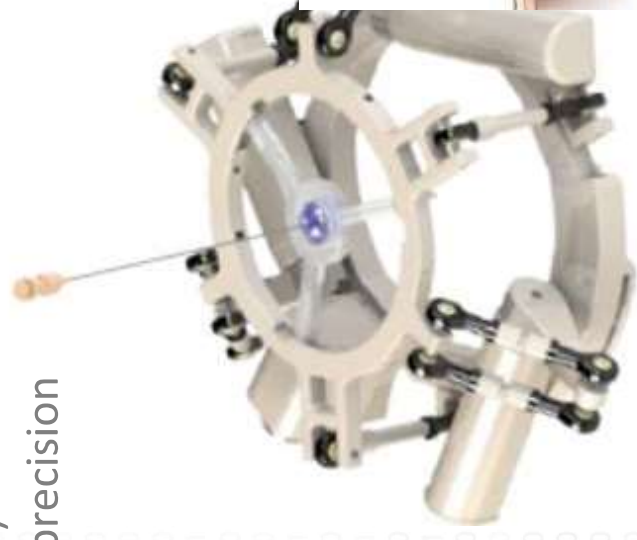
World 1st Robotics System with A.I. & Image Processing for Automated Lesion Targeting

- Robotics System with A.I. Control Algorithm
- Image analysis for Calibration and automated positioning
- Real time image extraction using existing imaging modalities
- Image guided Minimally Invasive Surgery (MIS)
- Auto aligning needle to target 3D space with precision
- For Lesion Biopsy, Tumor Ablation

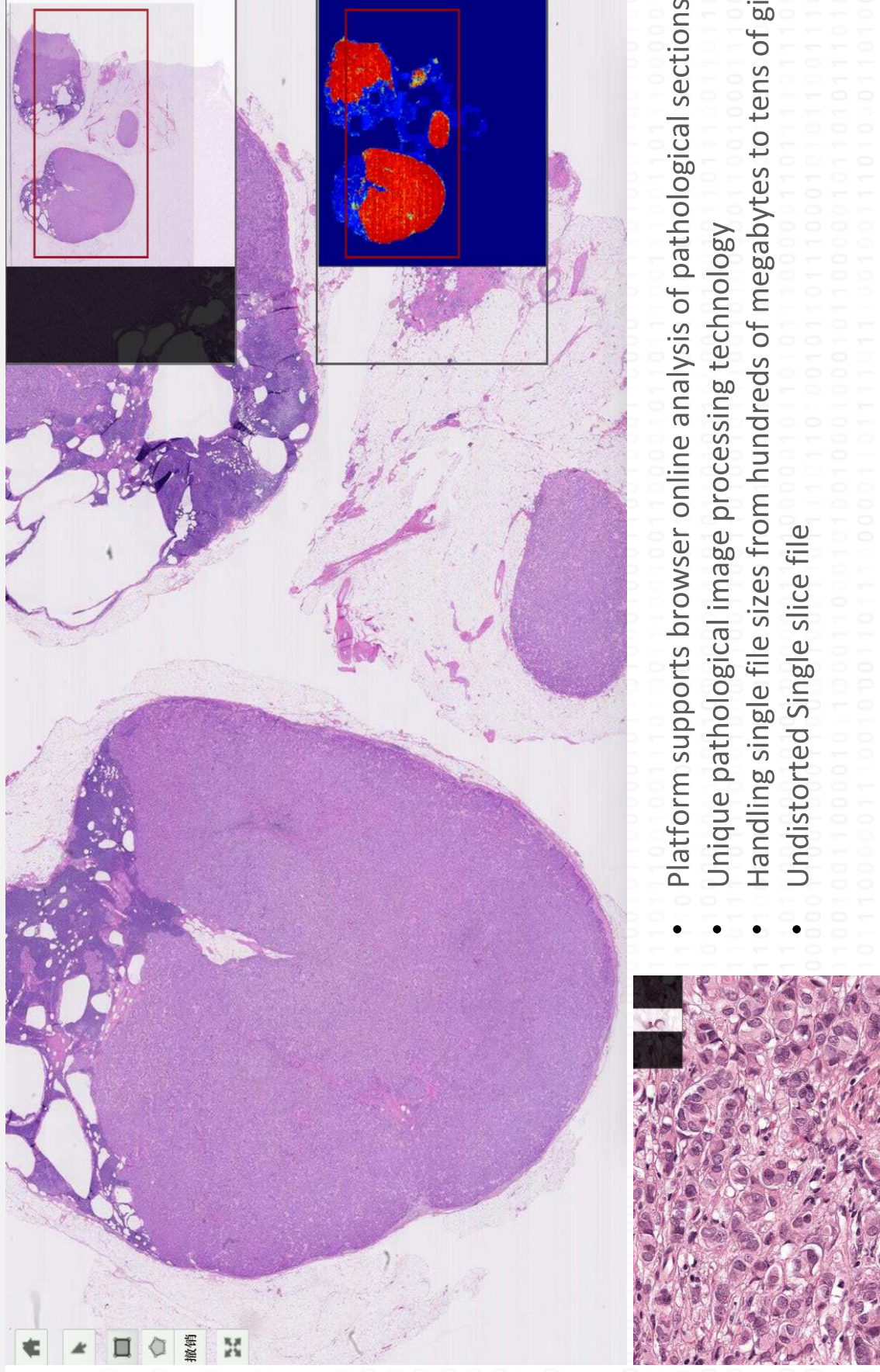
- Non Disruptive to surgical procedure,
reduce radiation time exposure with pin
point accuracy



Hardware
Delta Robot

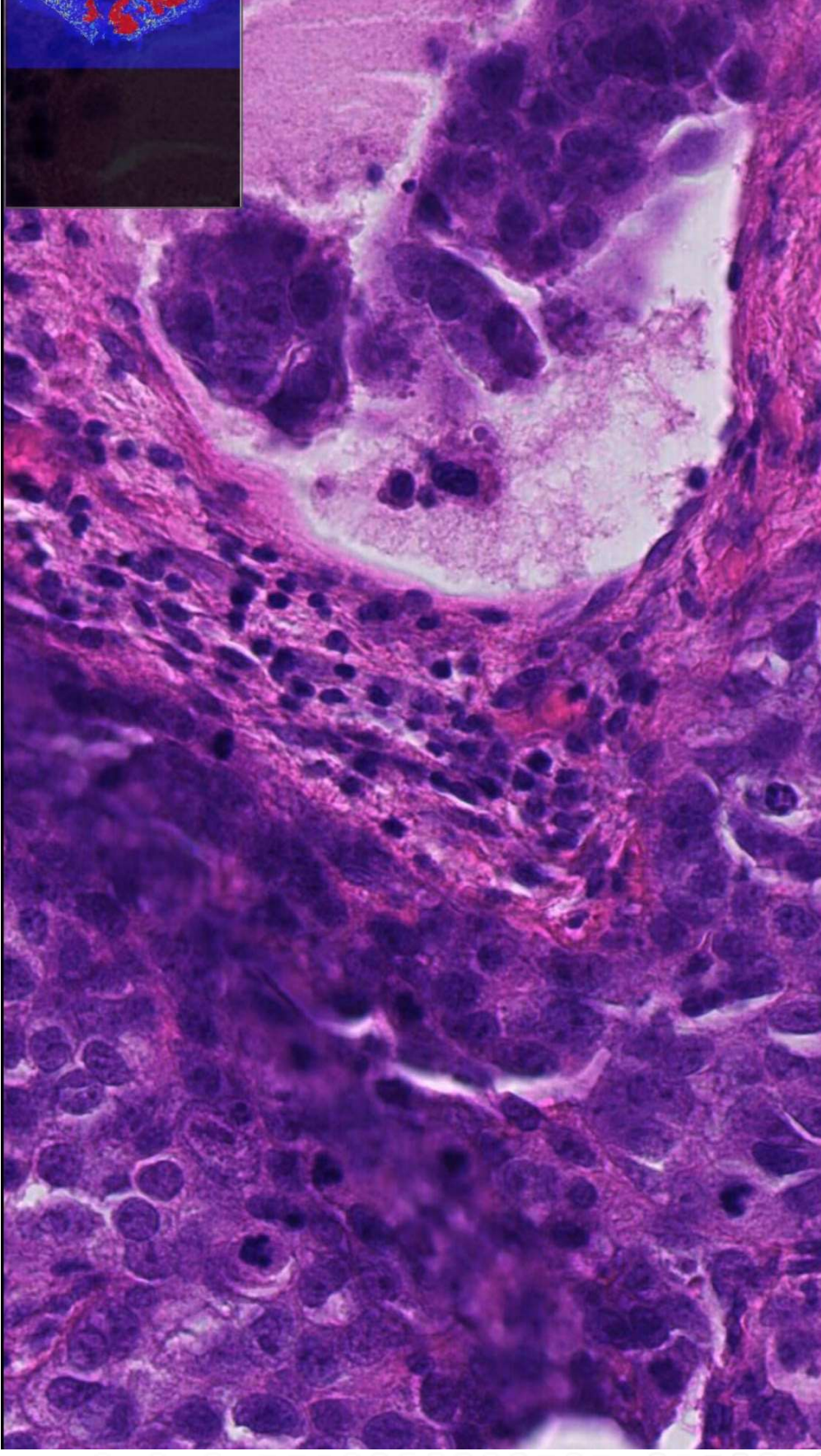


Intelligent Remote Pathology Diagnostic Platform



- Platform supports browser online analysis of pathological sections
- Unique pathological image processing technology
- Handling single file sizes from hundreds of megabytes to tens of gigabytes
- Undistorted Single slice file

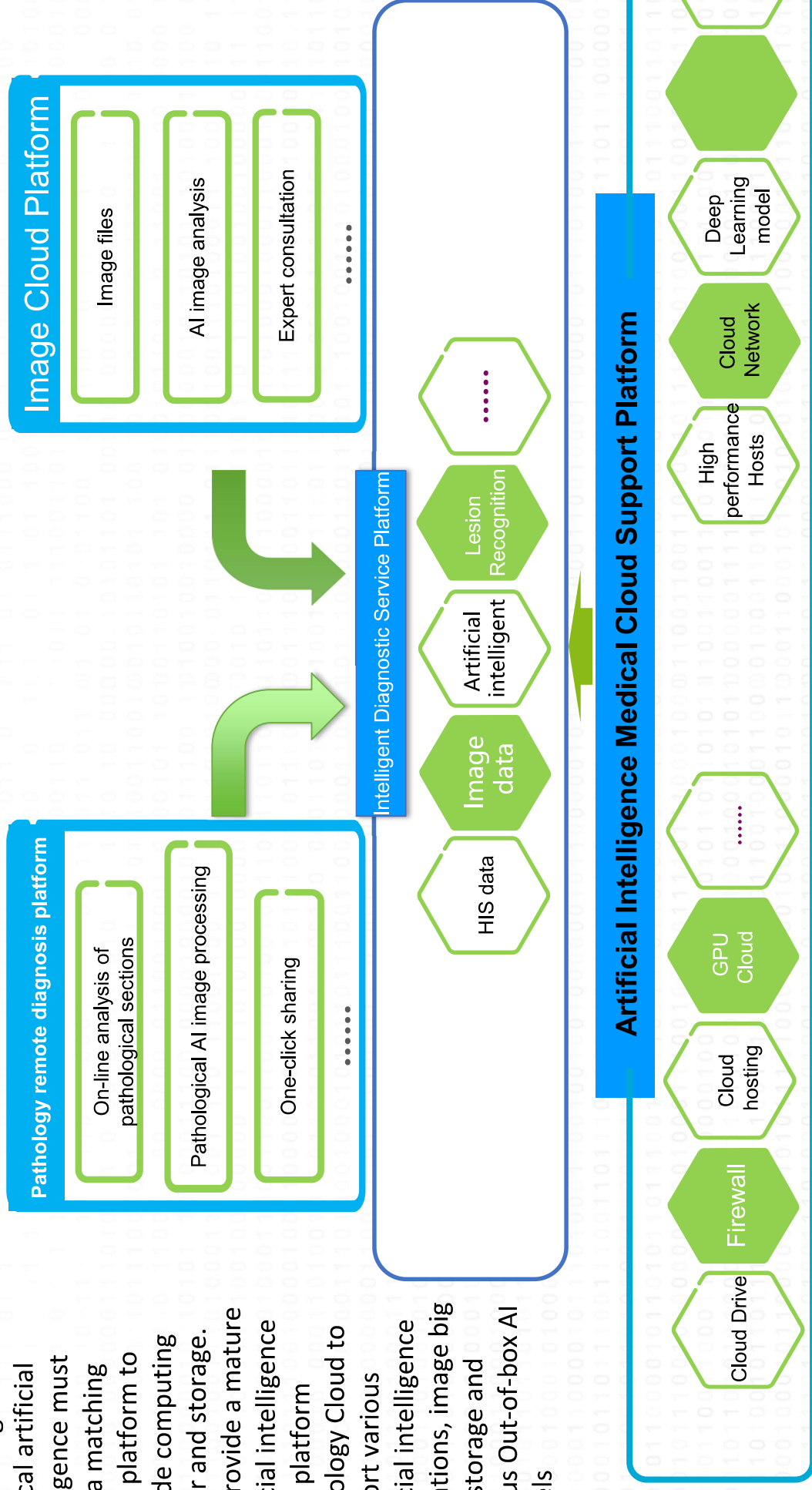
Intelligent Remote Pathology Diagnostic Platform



• Digital Tele Pathodology

AI Smart Image Cloud Platform: Deepology Cloud

The landing of medical artificial intelligence must have a matching cloud platform to provide computing power and storage. We provide a mature artificial intelligence cloud platform Deepology Cloud to support various artificial intelligence operations, image big data storage and various Out-of-box AI models



AI Smart Image Cloud Platform



Epoch
000,000

Learning rate
0.03

Activation
Tanh

Regularization
None

Regularization rate
0

Problem type
Regression

DATA

Which dataset do you want to use?



Ratio of training to test data: **50%**

Noise: **0**

Batch size: **10**

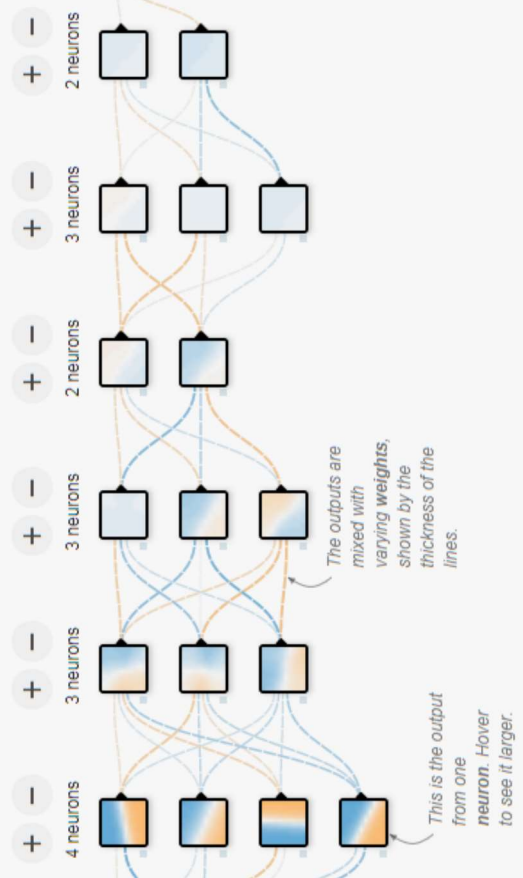
REGENERATE

FEATURES

Which properties do you want to feed in?

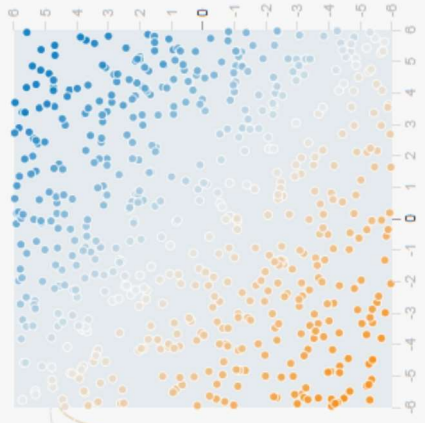


6 HIDDEN LAYERS



OUTPUT

Test loss **0.127**
Training loss **0.127**



Colors show data, neuron and weight values.

Show test data Discretize output

AI Smart Image Cloud Platform Features

- Connect the in-hospital imaging department through the PACS system to the needs of mobile reading and expert consultation.
- Reduce storage costs by 50% through unique compression algorithms advanced hyper-convergence storage, greatly reducing the storage cost availability of ever-increasing image data
- To provide artificial intelligence analysis of image capabilities, such as: nodules artificial intelligence analysis.

Industrial Model: Artificial Intelligence Medical Cloud



Traditional / new hospital

Using Model Services and High Performance Cloud Computing

Provides AI models and AI computing capabilities to help smart medical companies quickly build AI environments and achieve smart business quickly

Docking Medical AI Algorithm Company/Expert Turns AI Models into Services, Trains Models, Incubates New AI Medical Companies



Third-party laboratory

Input data for the platform, using models and cloud computing capabilities to make traditional business AI



Output AI model

Training AI models using data/computational capabilities, and providing models to the left-side medical institutions through paid platforms

Third-p



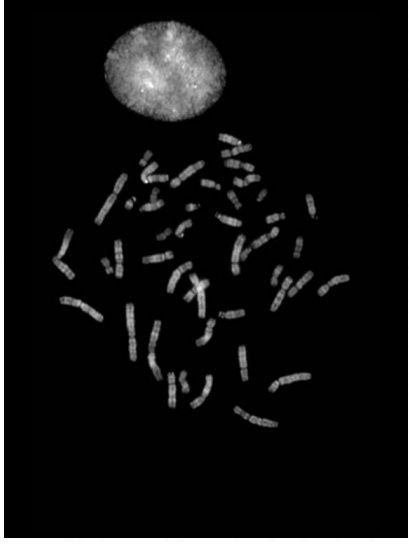
Smart medical applications

Using models, computing power to create smart medical new business

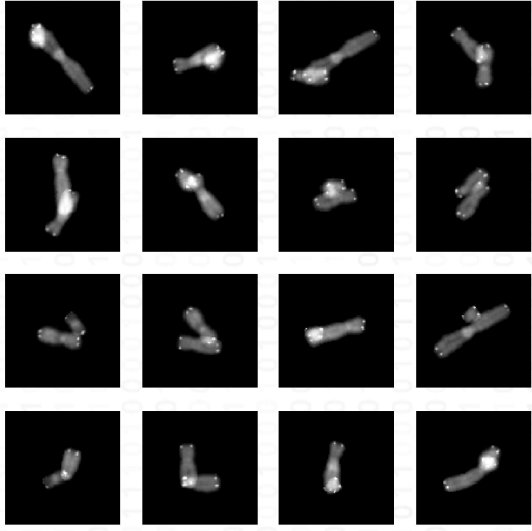
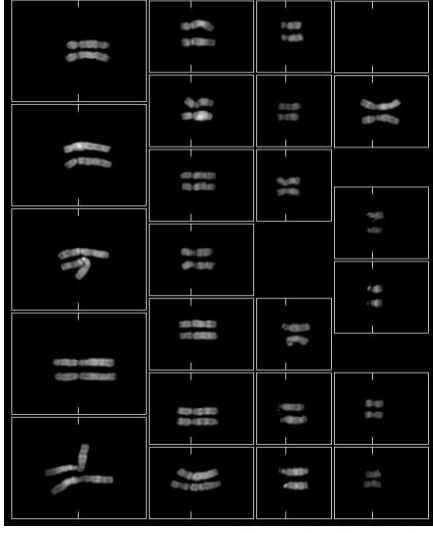
Training AI models with data/computation capabilities, incubating new AI companies

Third

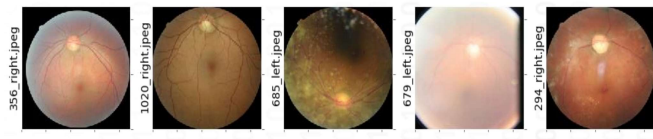
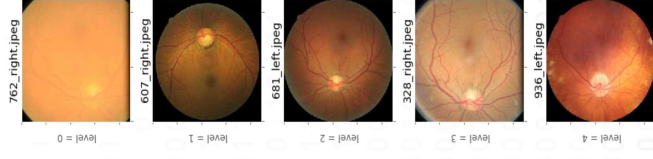
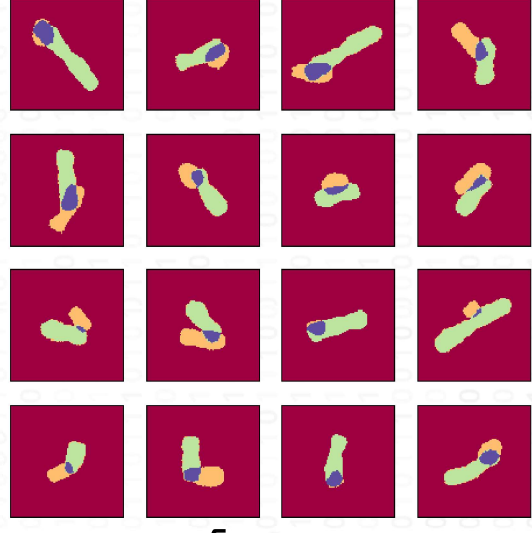
Other Artificial Intelligence Solution



Chromosome recognition



Chromosome overlap recognition



Diabetic retin

Intelligent Medical Diagnostic Imaging Cloud Machine



Intelligent medical diagnostic imaging machine



- Provide medical image AI analysis to assist hospital to quickly obtain analysis results
- Perfect combination of high performance deep machine algorithm and custom hardware
- One-click sharing of video resources within the organization
- Cross-regional remote consultation
- High-performance image processing hardware
- Support massive cloud data backup
- Support online algorithm upgrade, continuous precision treatment