



E-SAN THAILAND CODING & AI ACADEMY

โครงการวิจัยโมเดลระบบนิเวศการเรียนรู้ที่บูรณาการ CODING & AI สำหรับเยาวชน
Model of Learning Ecosystem Platform integrate with Coding & AI for Youth

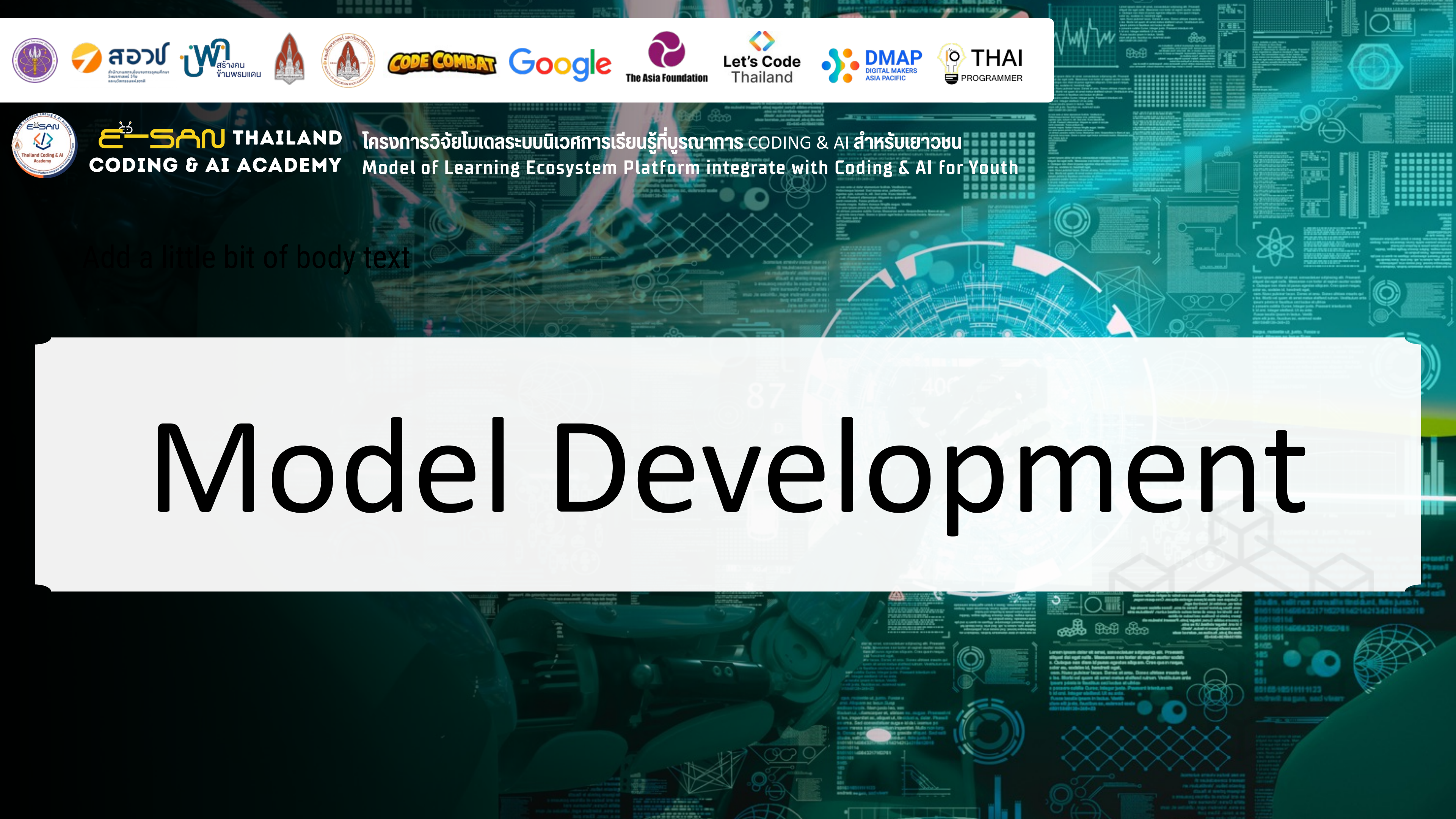


โครงการย่อยที่ 6

การพัฒนาเยาวชนเพื่อเข้าสู่วิชาชีพขั้นสูงด้าน Coding & AI
ร่วมกับ Coding Entrepreneur & Partnership: **Personal AI**

BiTNet: AI for Ultrasound Image Classification

ผศ.ดร.ธนพงศ์ อินทะ
ผู้เชี่ยวชาญด้าน Computer Vision

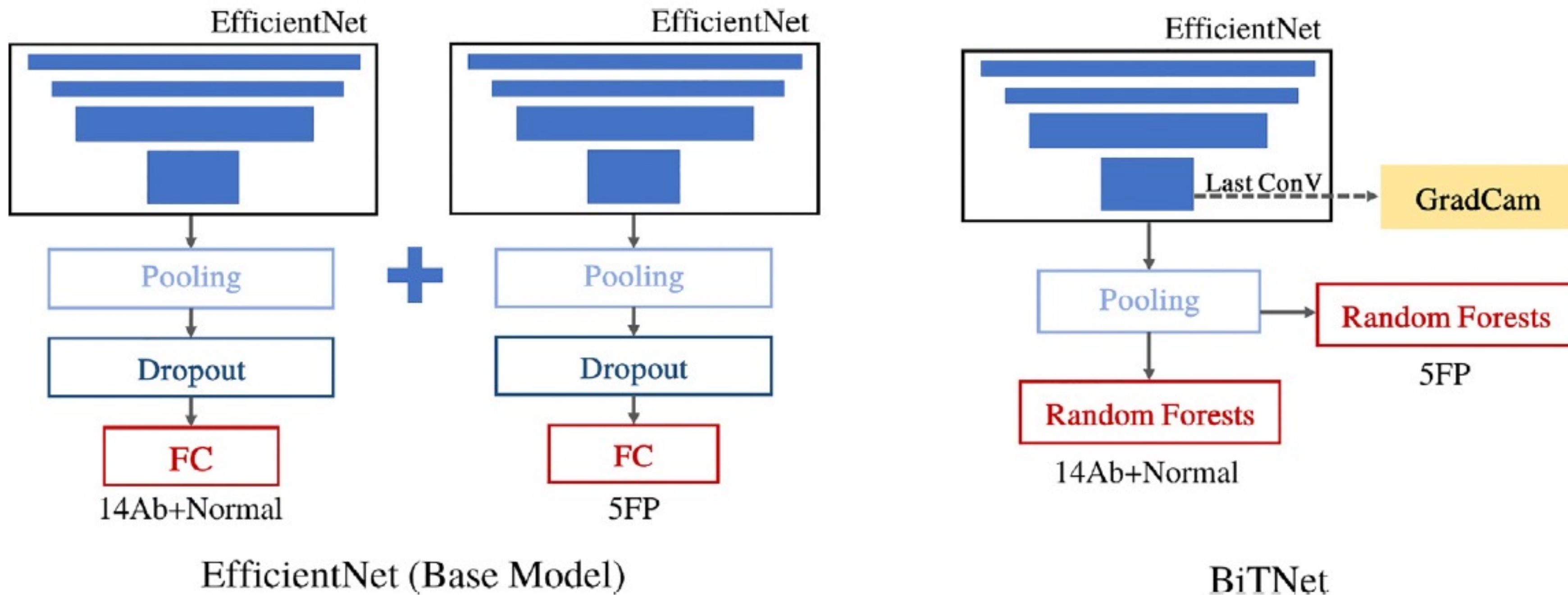


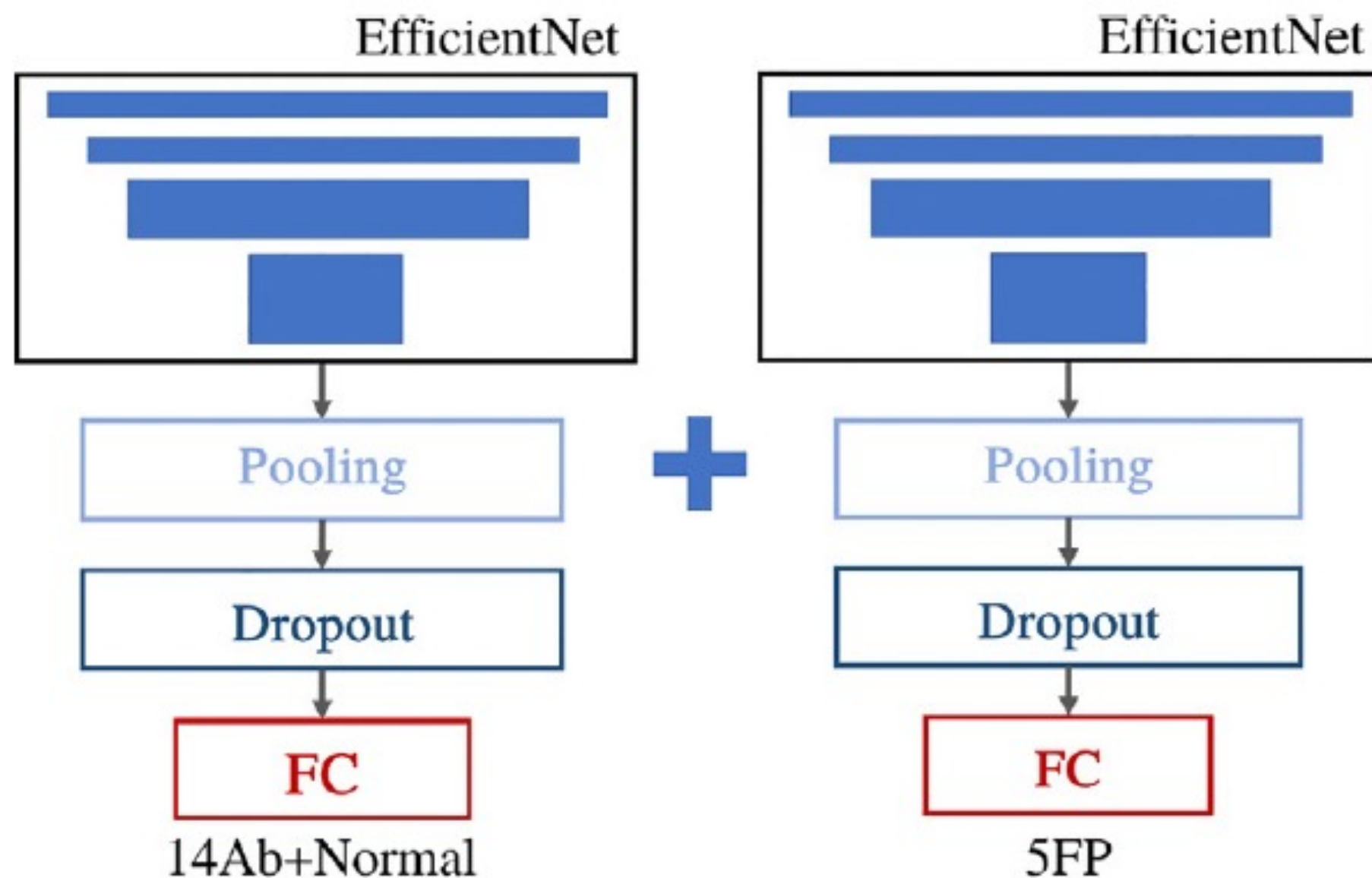
E-SAN THAILAND
CODING & AI ACADEMY

โครงการวิจัยโมเดลระบบนิเวศการเรียนรู้ที่บูรณาการ CODING & AI สำหรับเยาวชน
Model of Learning Ecosystem Platform integrate with Coding & AI for Youth

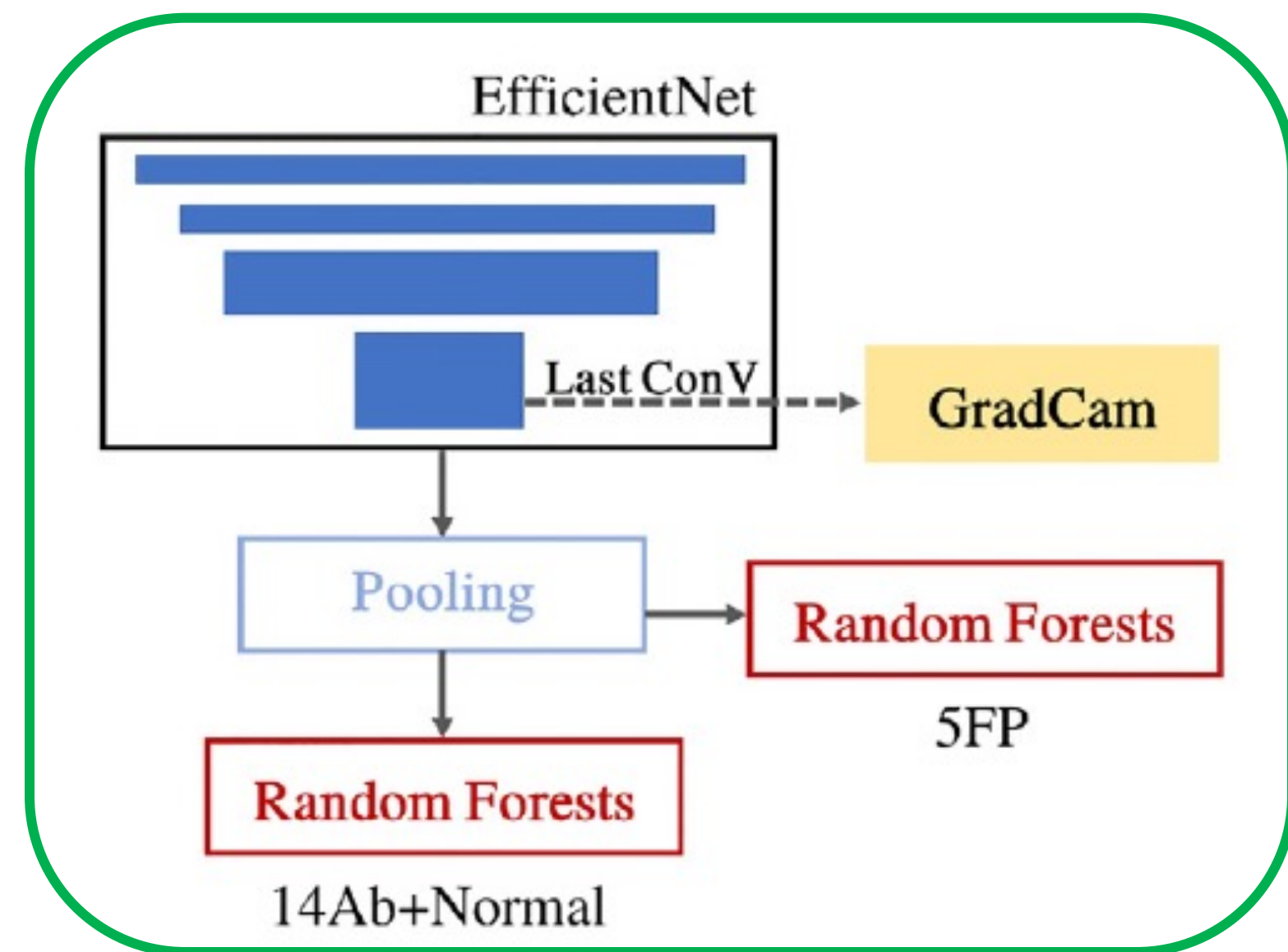
Add a little bit of body text

Model Development





EfficientNet (Base Model)



BiTNet

Biliary Tract Network

EfficientNet

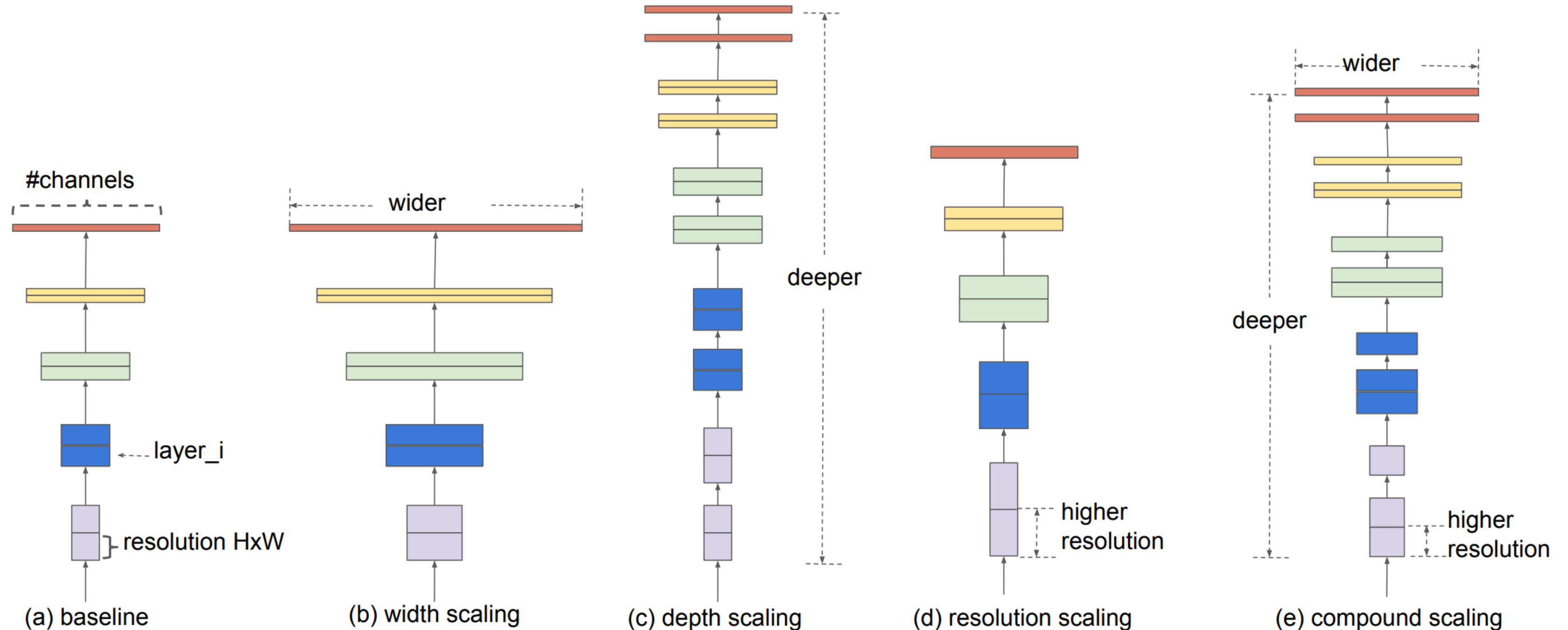
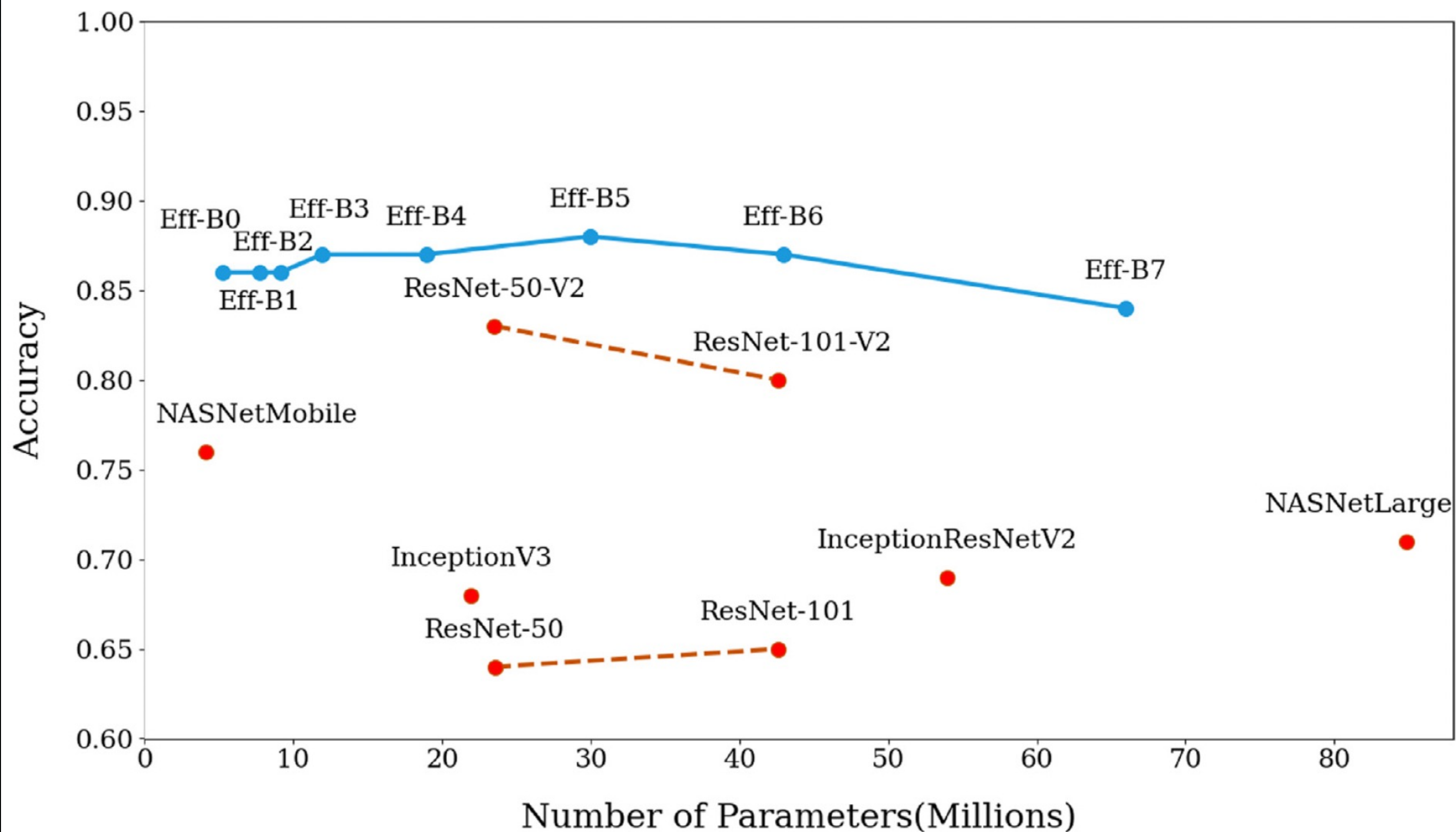
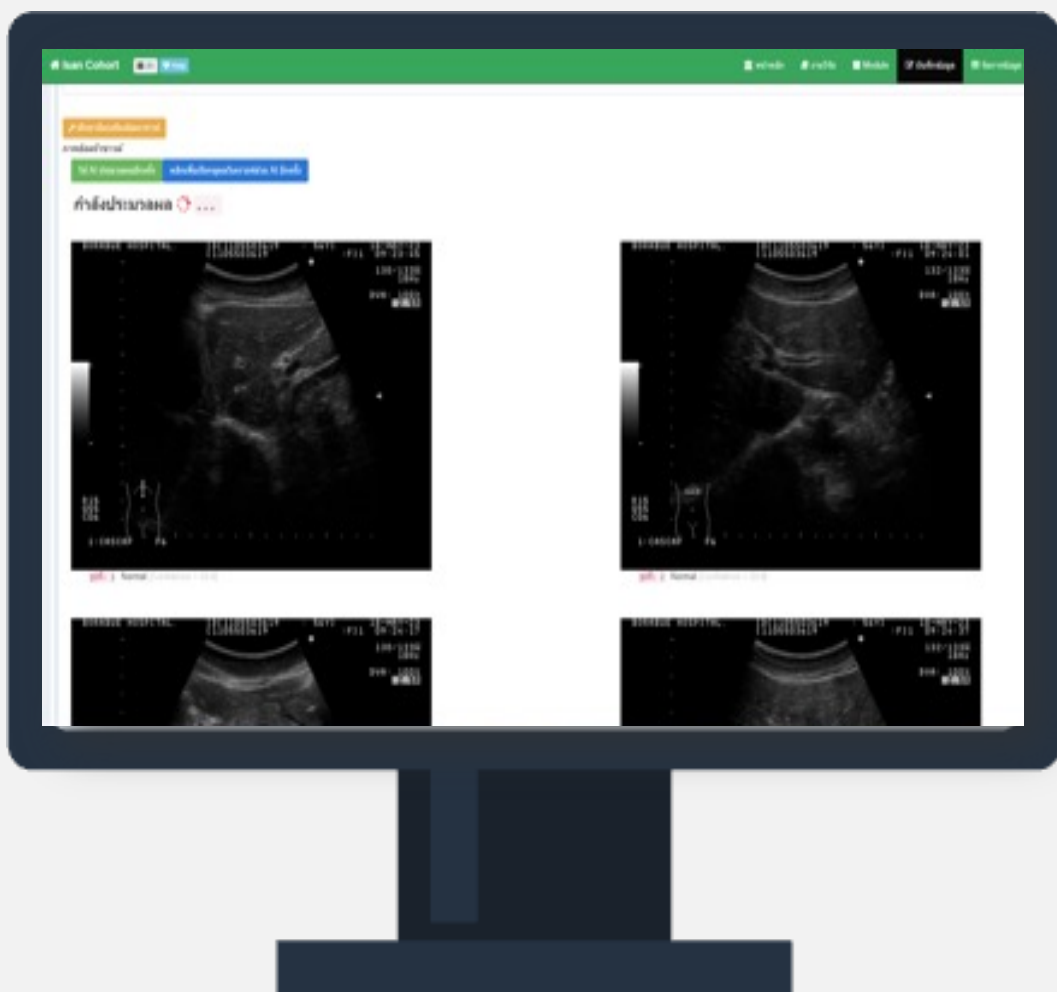


Figure 2. Model Scaling. (a) is a baseline network example; (b)-(d) are conventional scaling that only increases one dimension of network width, depth, or resolution. (e) is our proposed compound scaling method that uniformly scales all three dimensions with a fixed ratio.

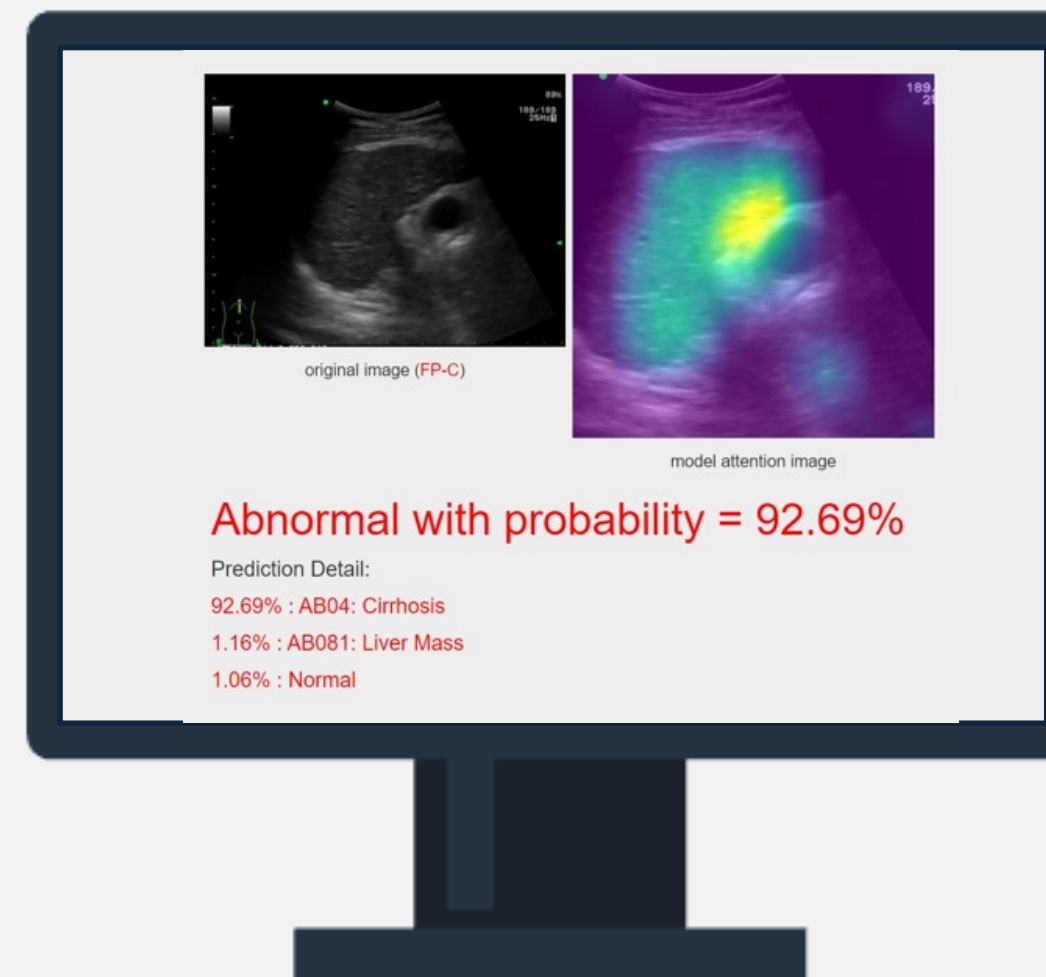
Performance Comparison of Base Models



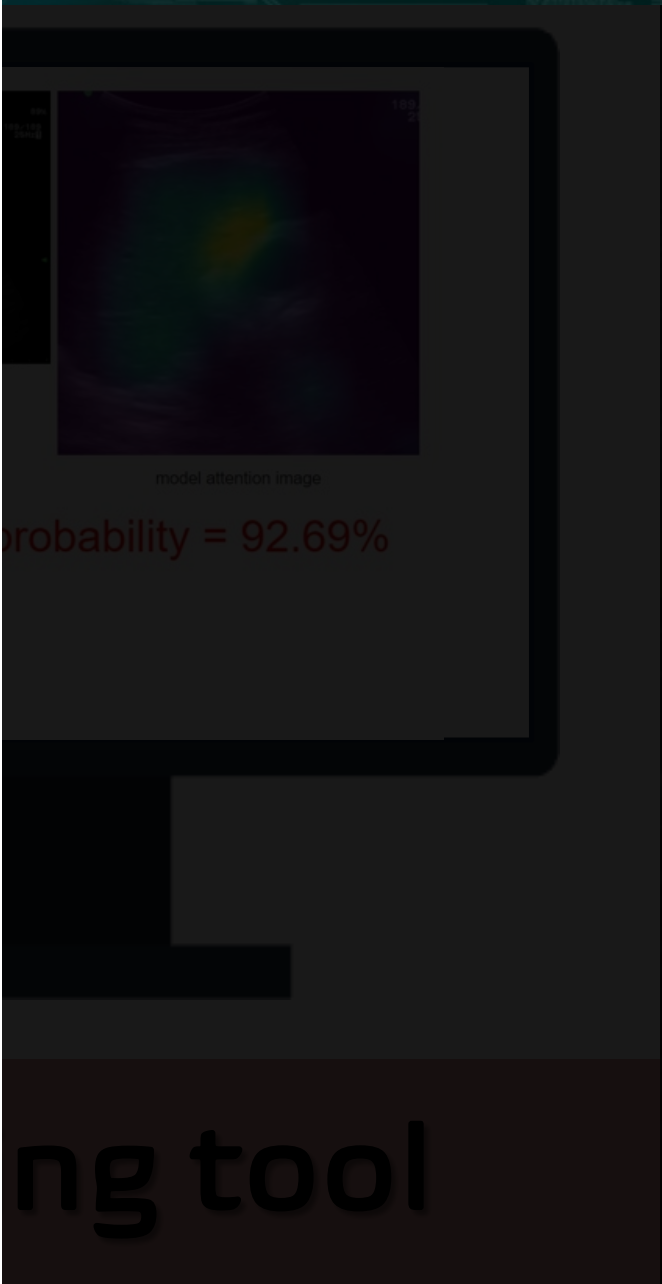
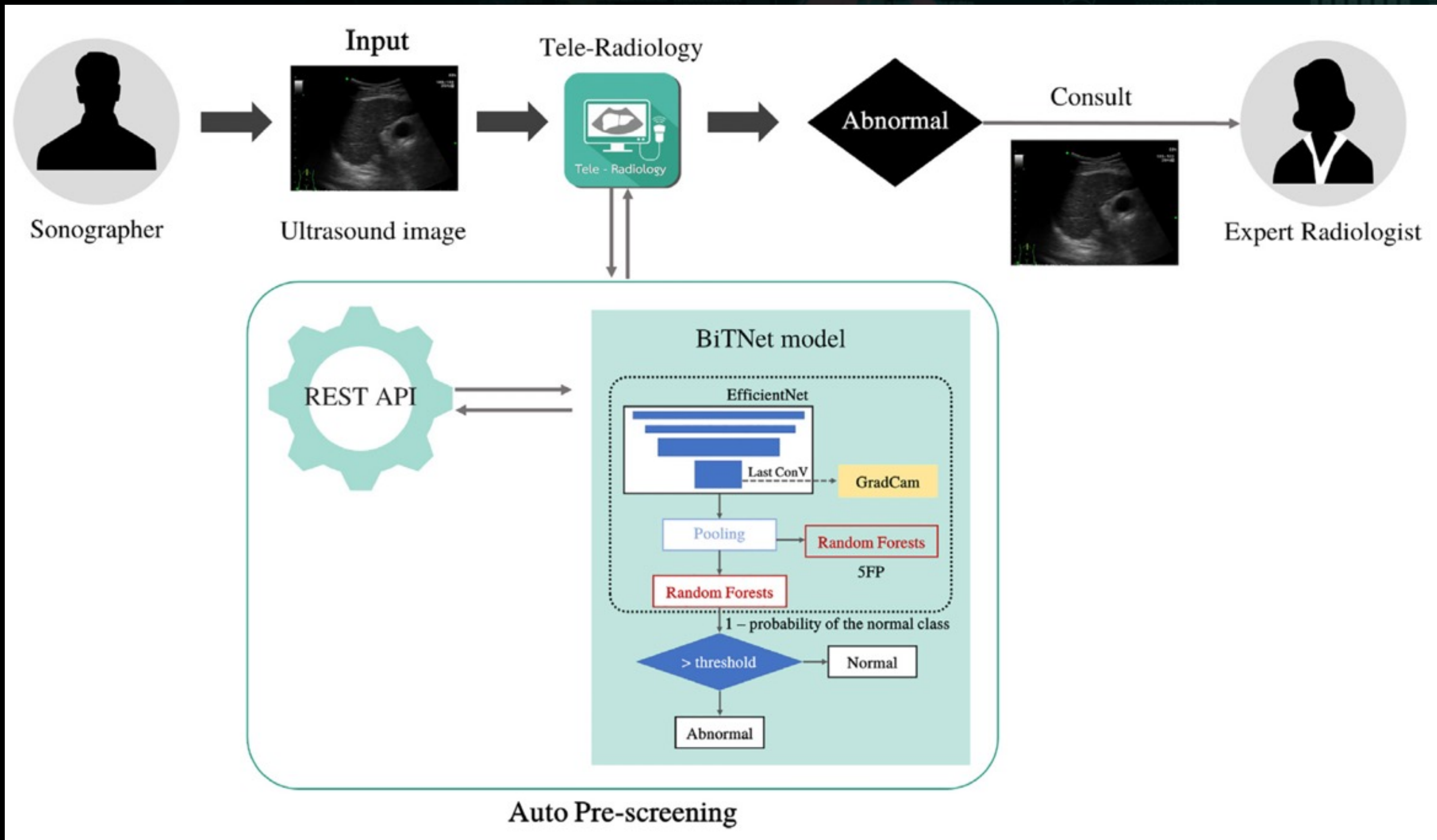
2 Applications



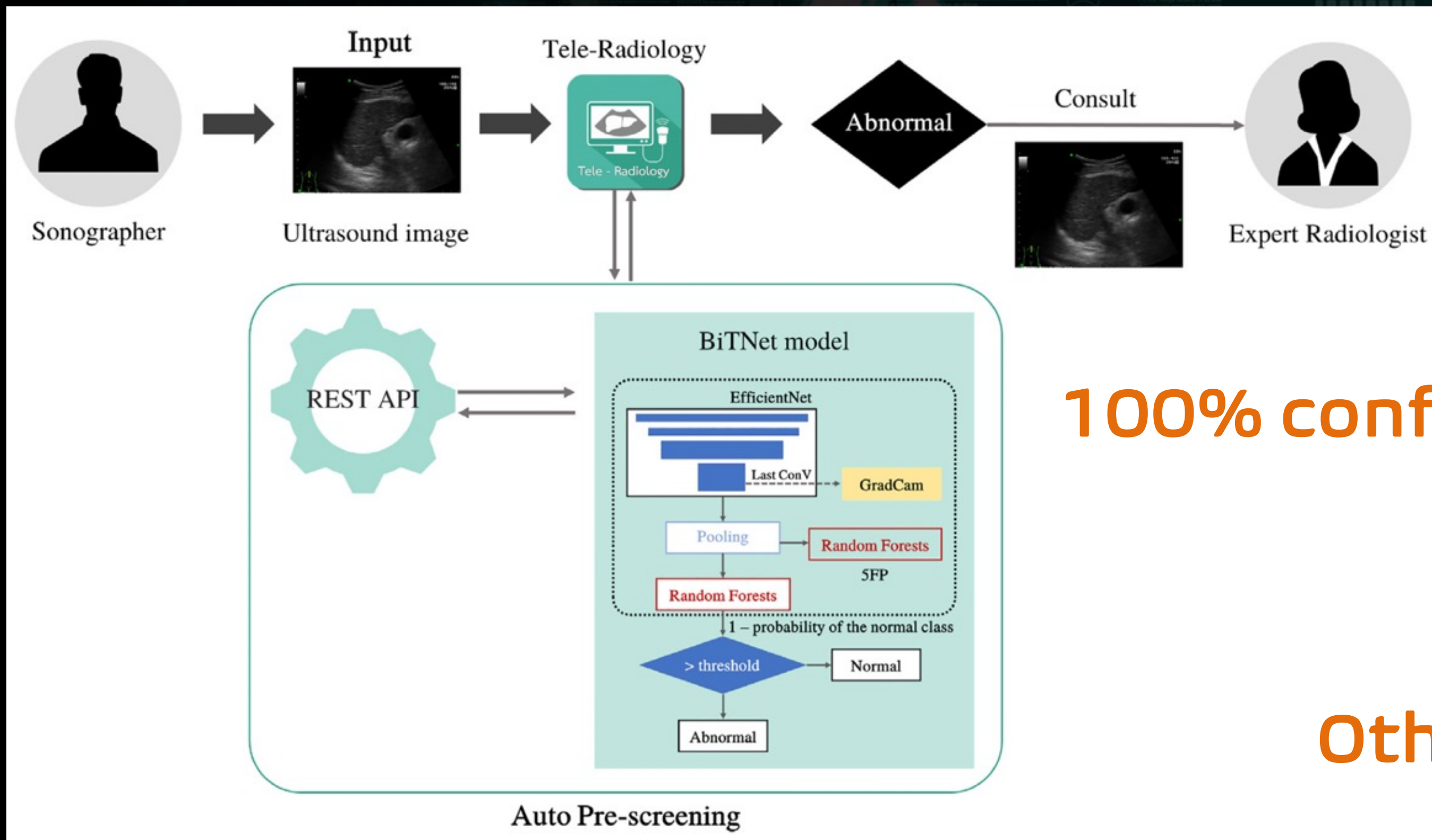
Auto Pre-screening



Assisting tool



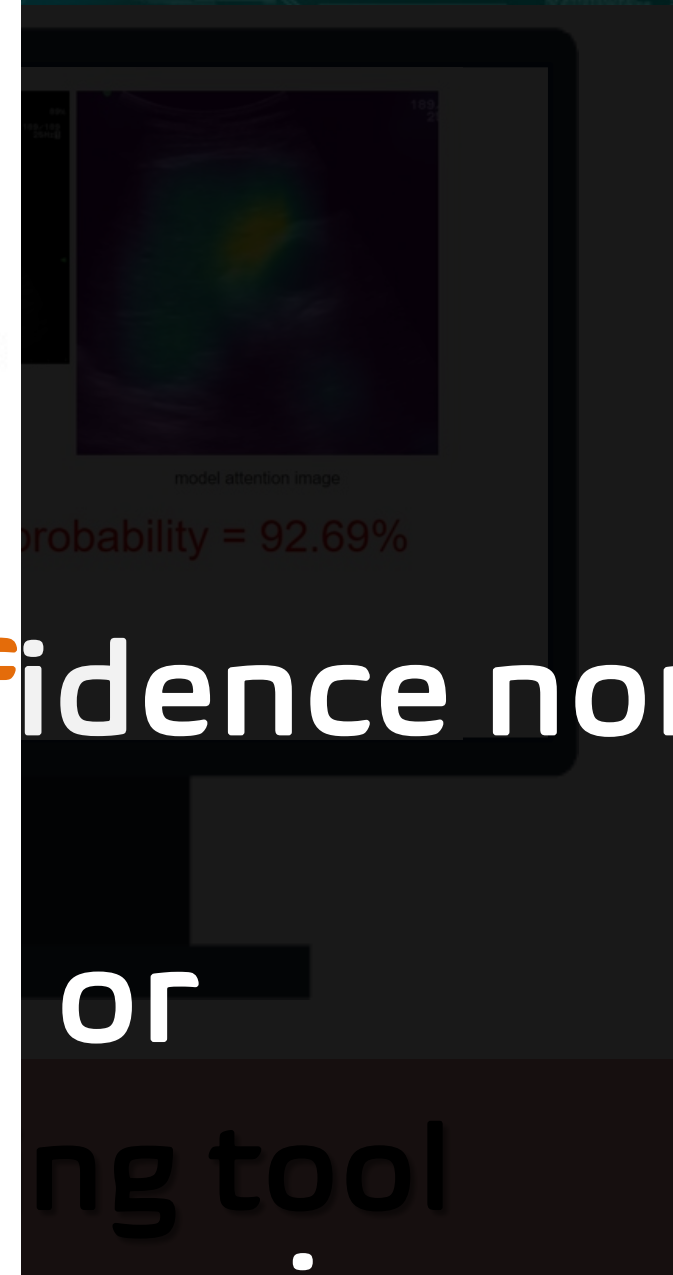
1st Application



100% confidence normal

or

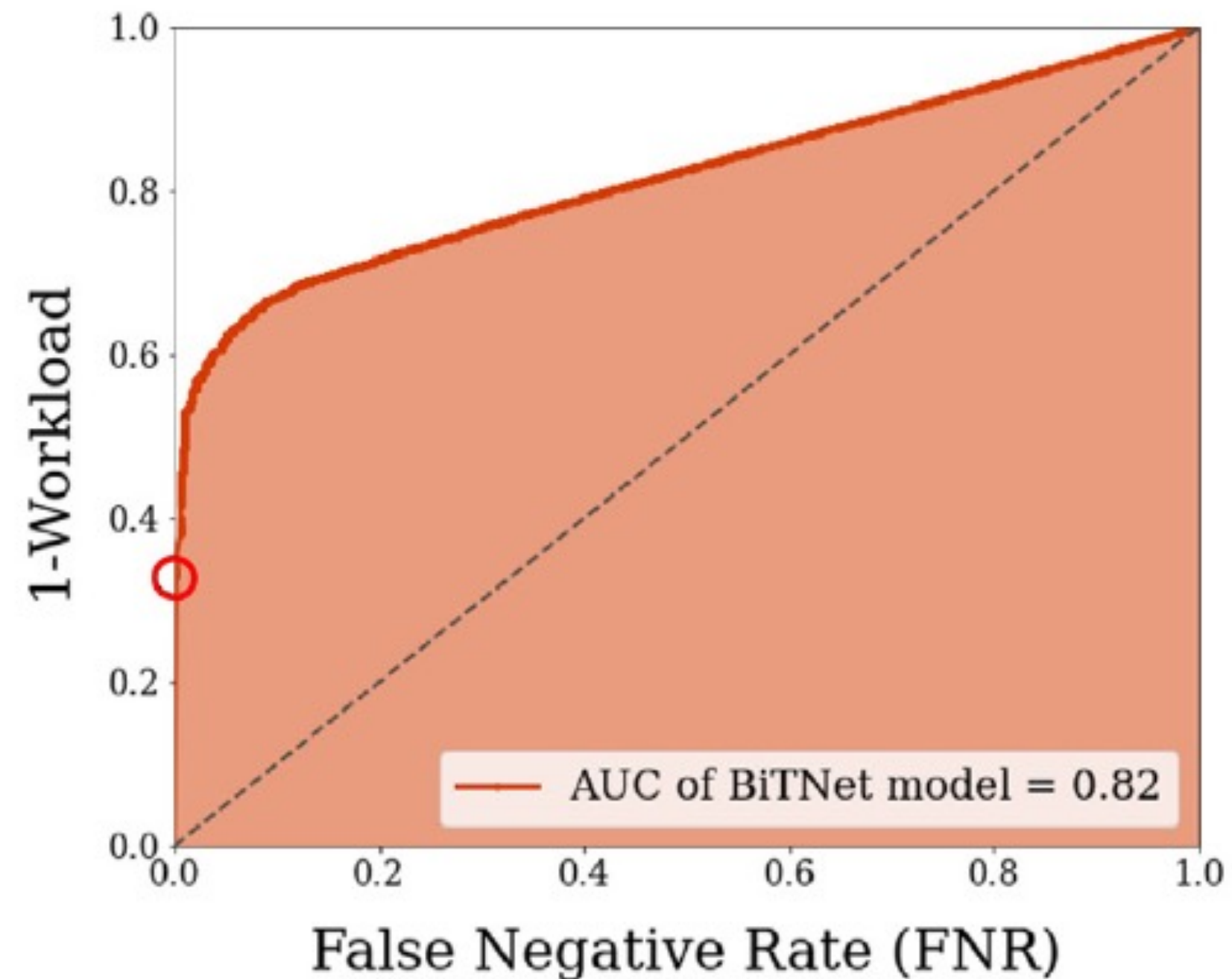
Otherwise

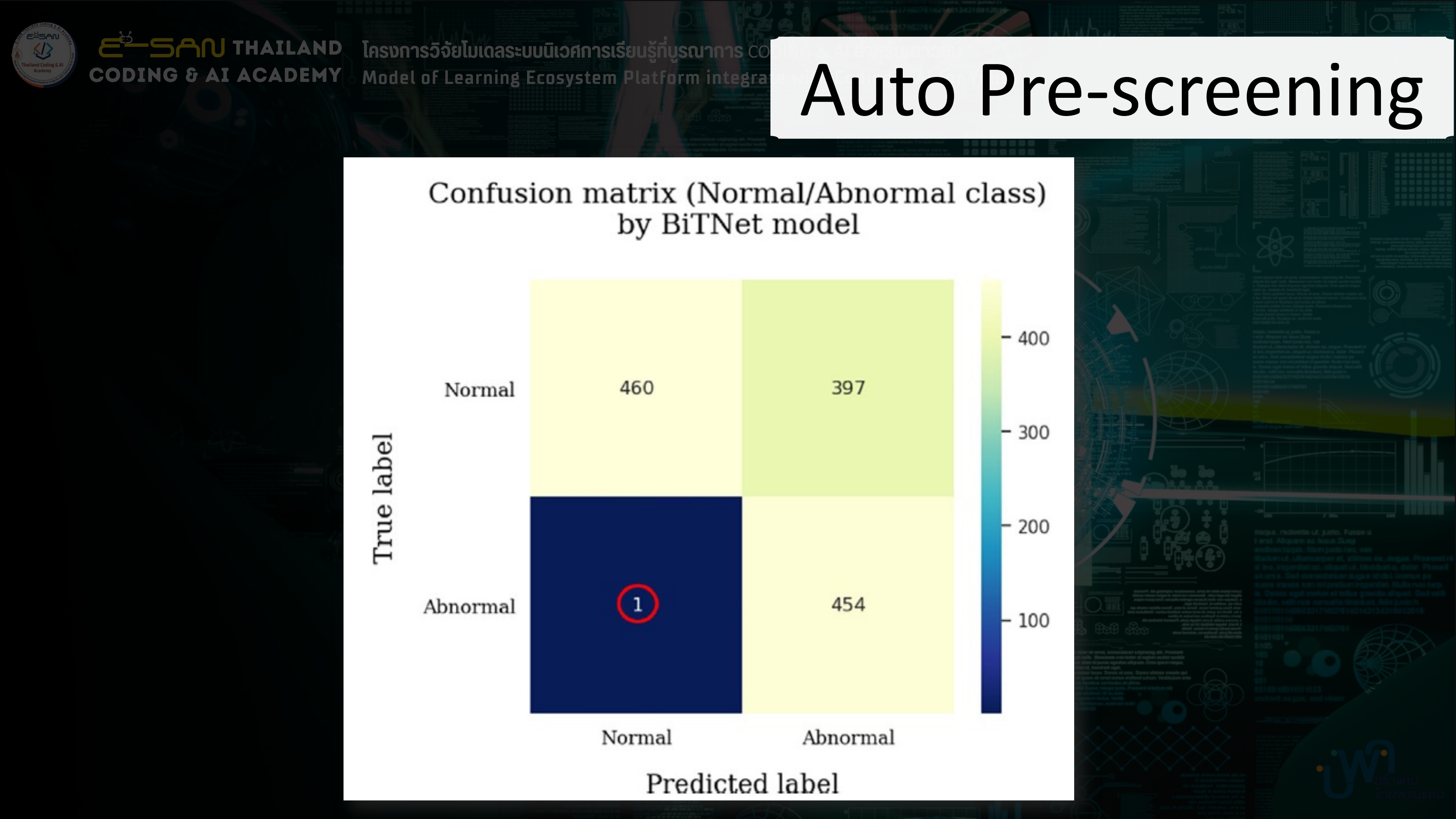


Auto Pre-screening

#images identified as abnormal
#submitted images

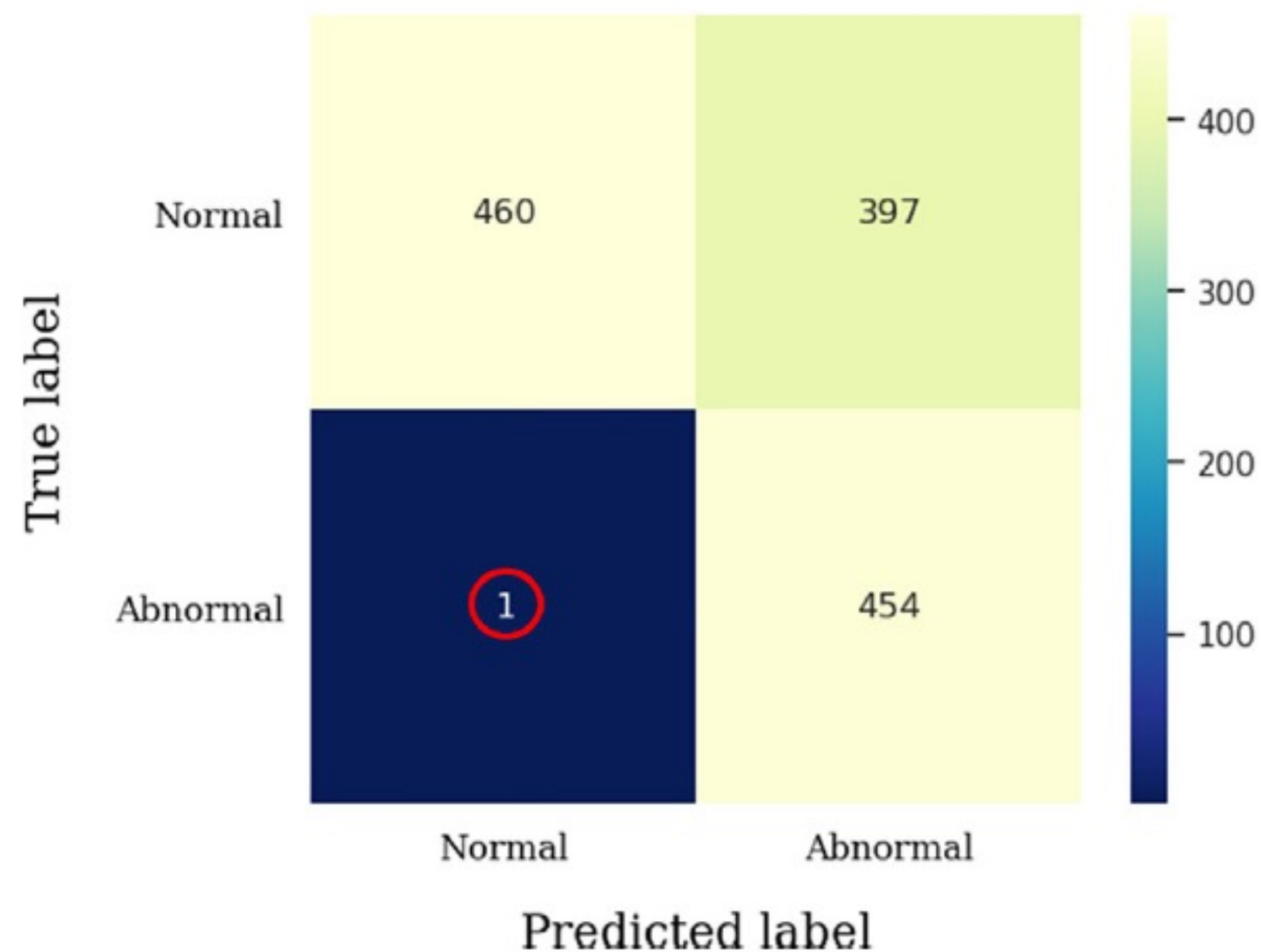
Comparison between workload reduction-rate and false negative rate when varies-thresholds of the model.





Auto Pre-screening

Confusion matrix (Normal/Abnormal class)
by BiTNet model



2nd Application

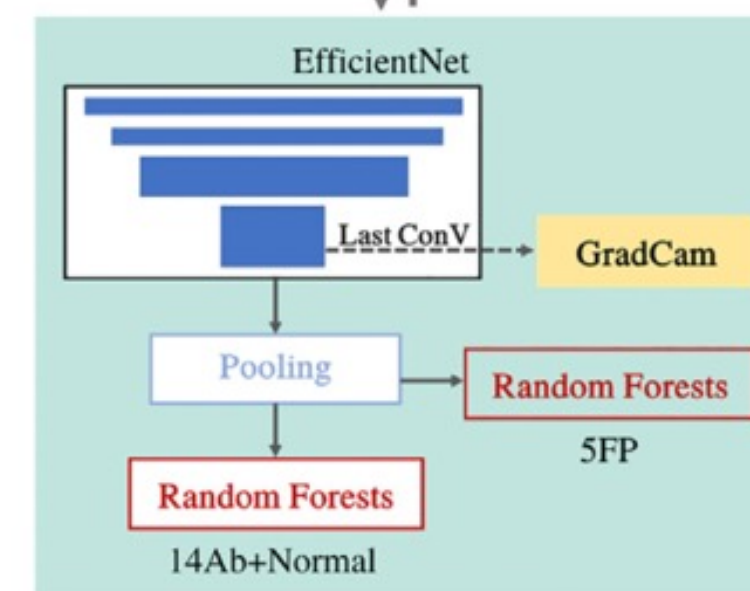
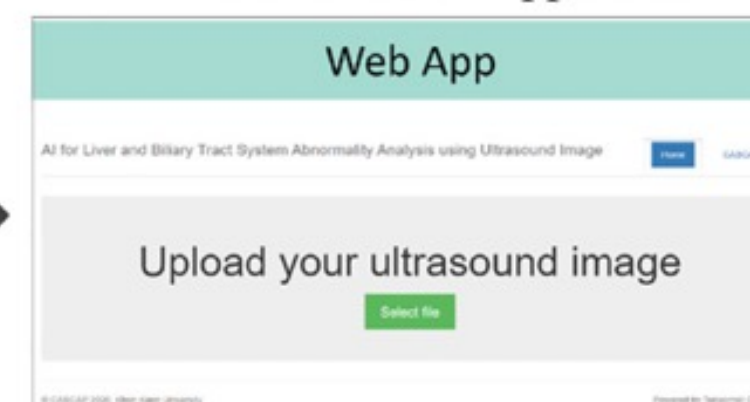


Sonographer

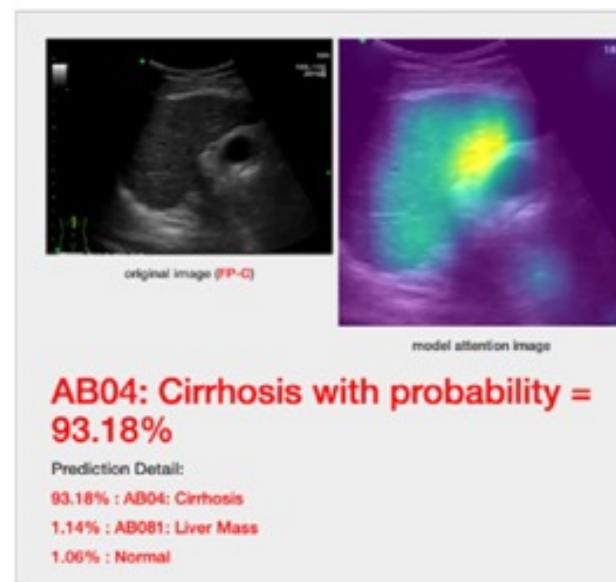


Ultrasound image

User interface: web application



BiTNet model



Output:

1. Class (1+14Abnormalities)
2. Prediction confidence
3. Model Attention
4. Viewing angle
5. Top 3 suggestion

Assisting tool

Auto Pre

Predict 15 classes

+

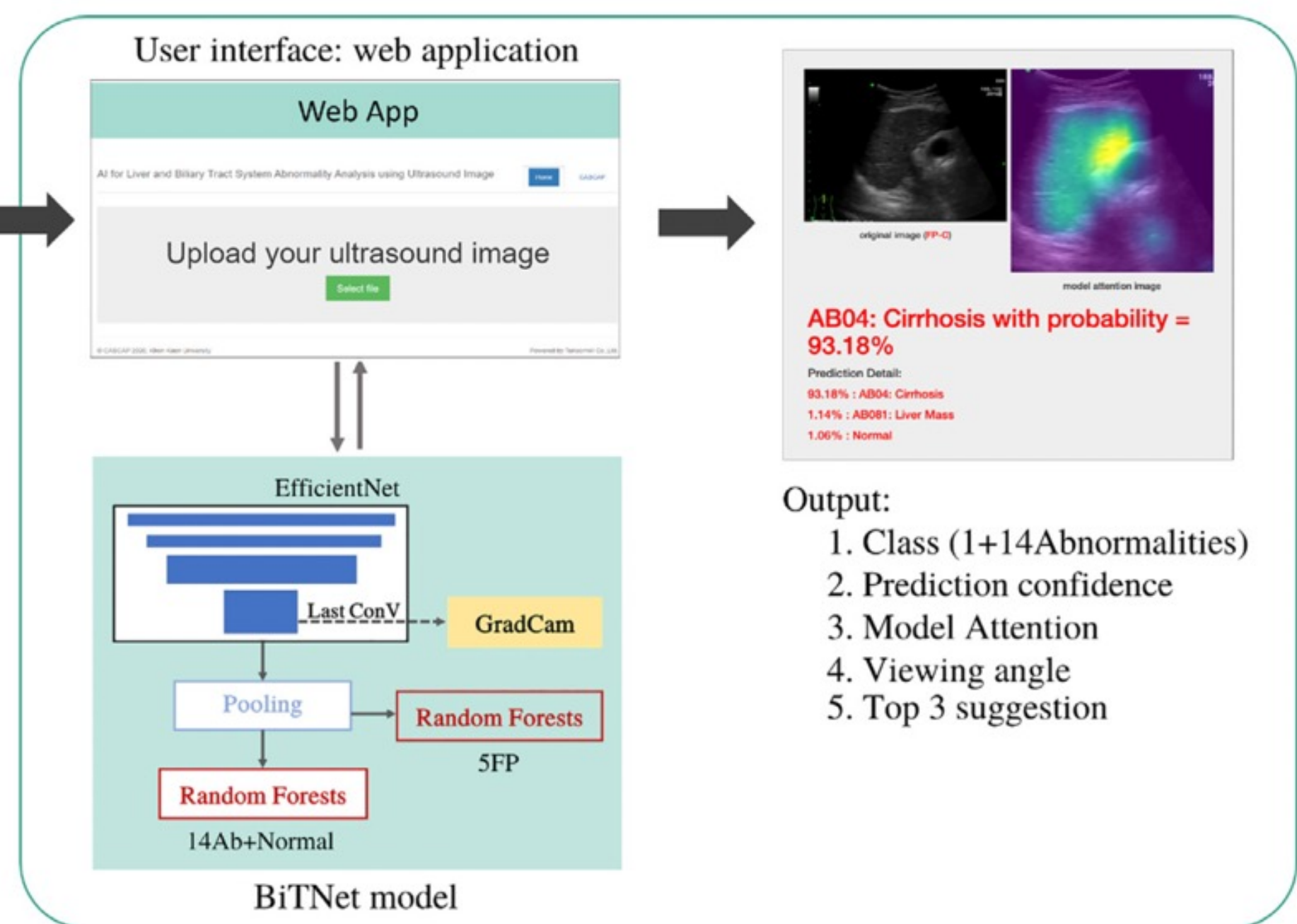
Auto Pre
eXplanable AI



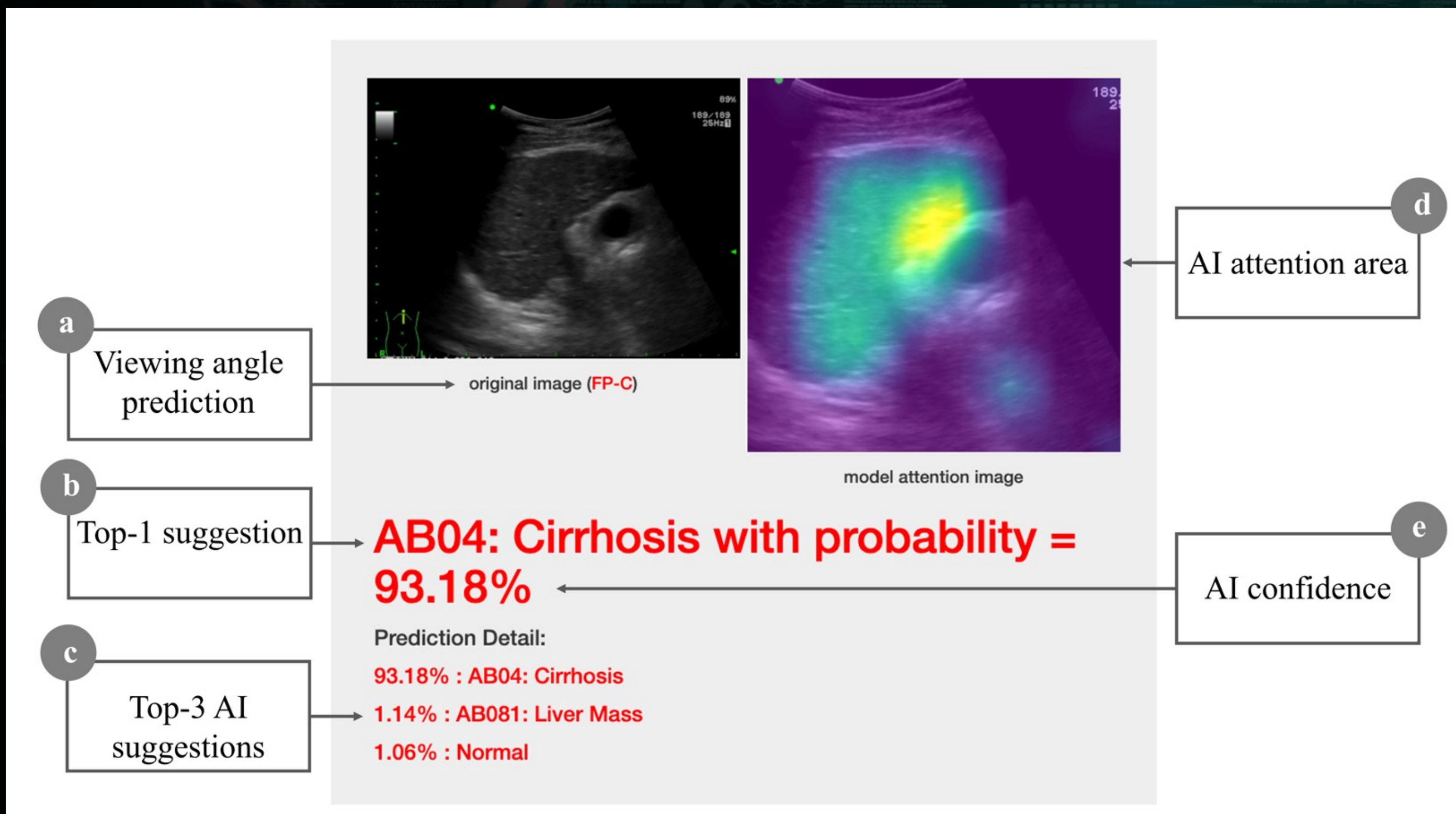
Sonographer



Ultrasound image

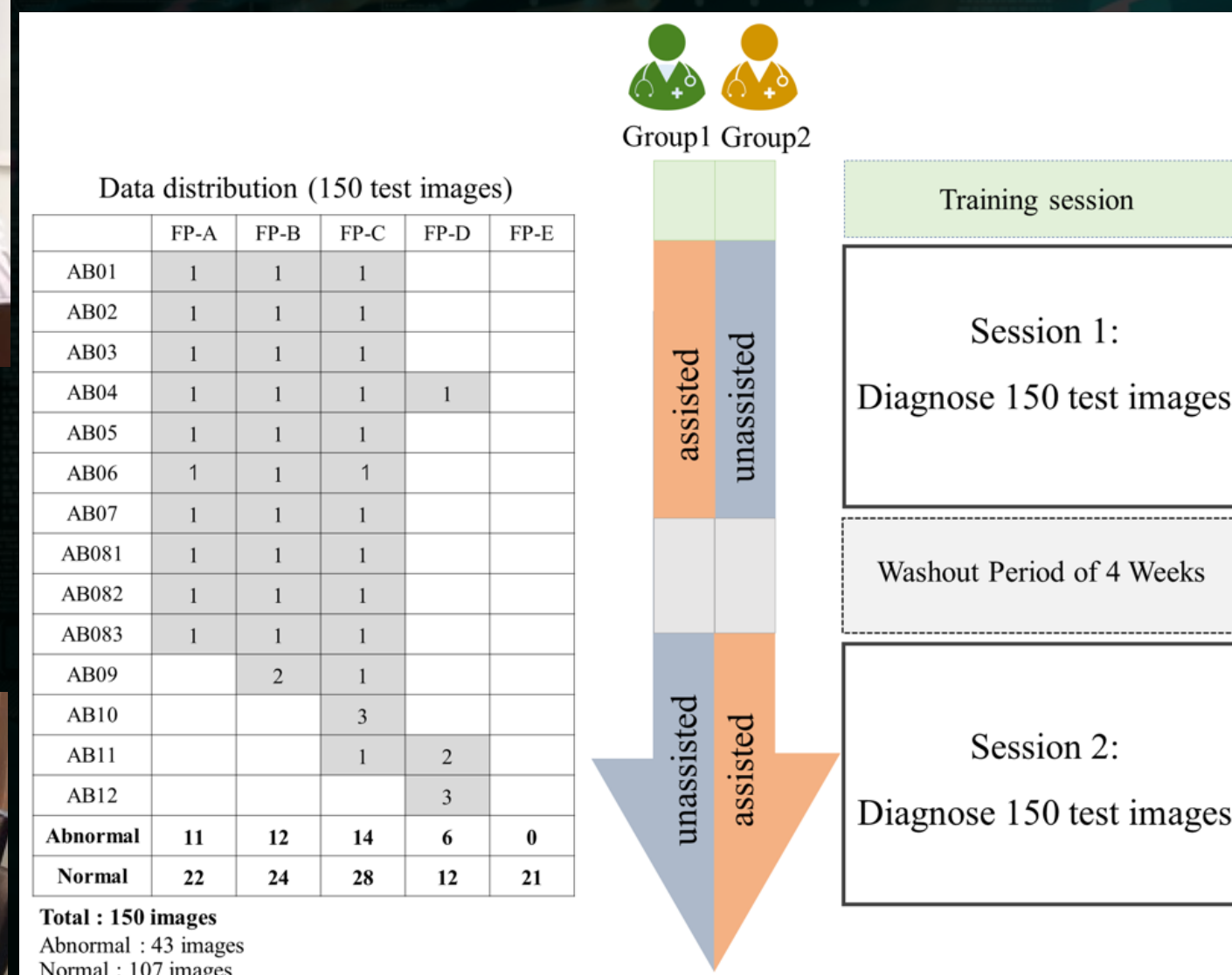


Assisting tool

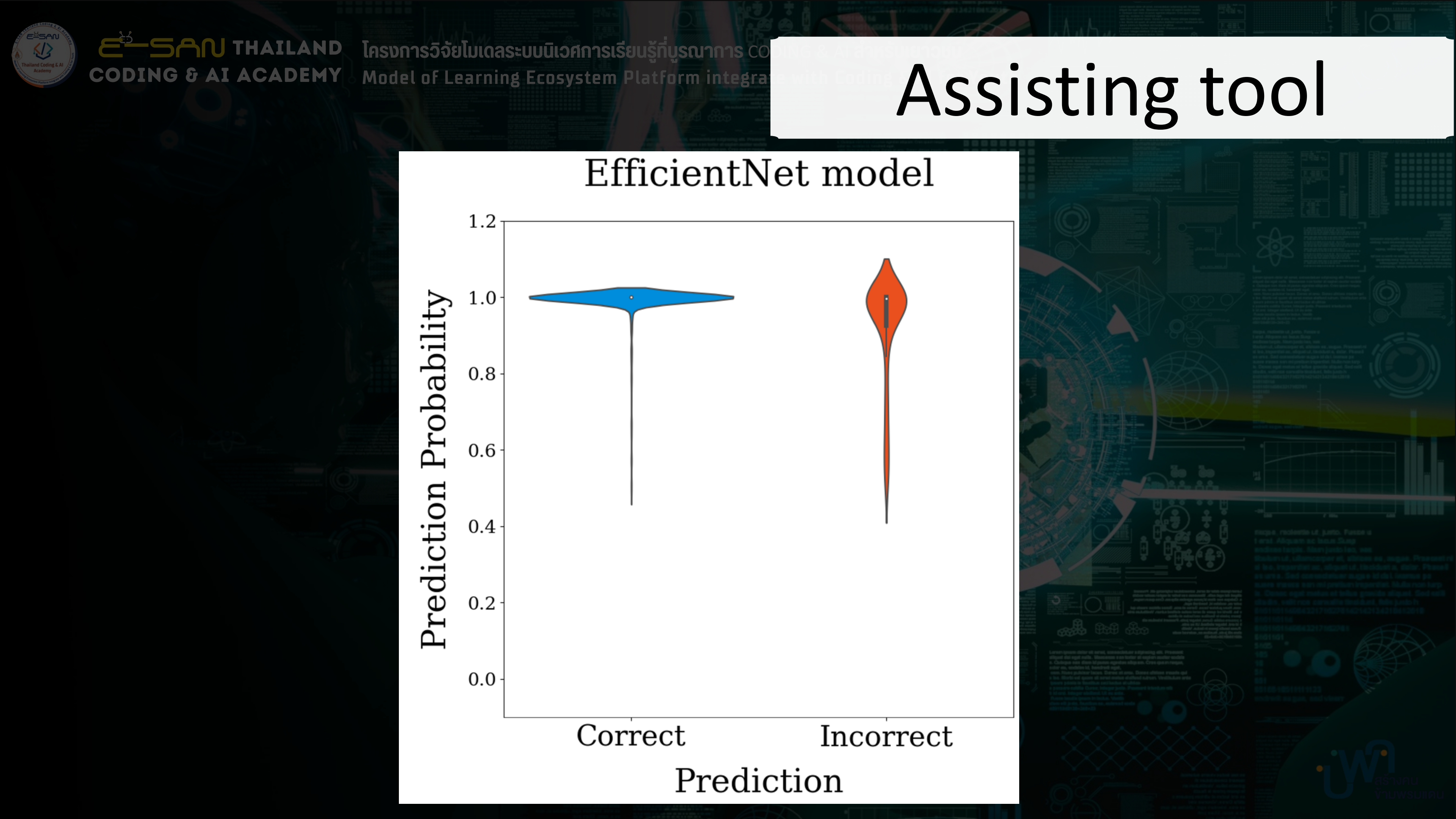




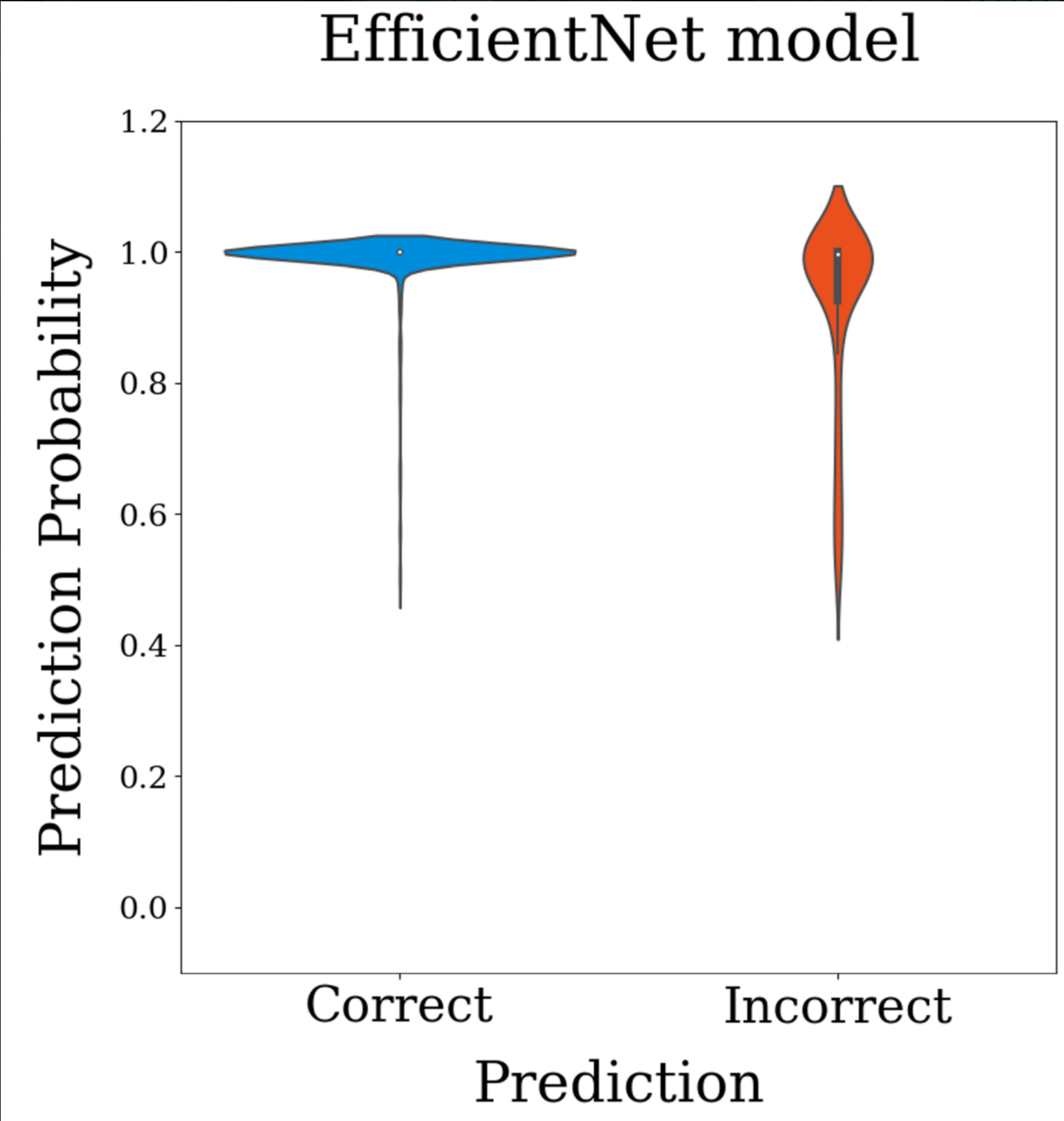
Assisting tool



5 general practitioners (GP's), 2 residence radiologists, 2 non-hepatobiliary radiologists and 2 hepatobiliary radiologists.

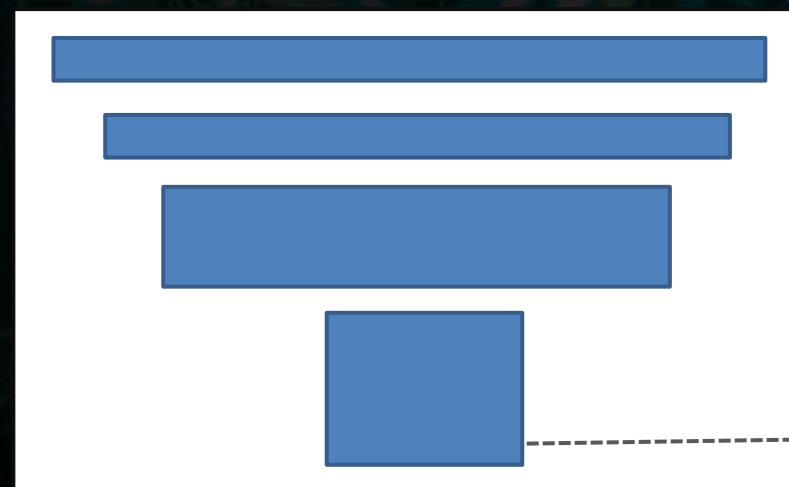


Assisting tool



Assisting tool

EffNet



GradCam (last ConV)

Pooling

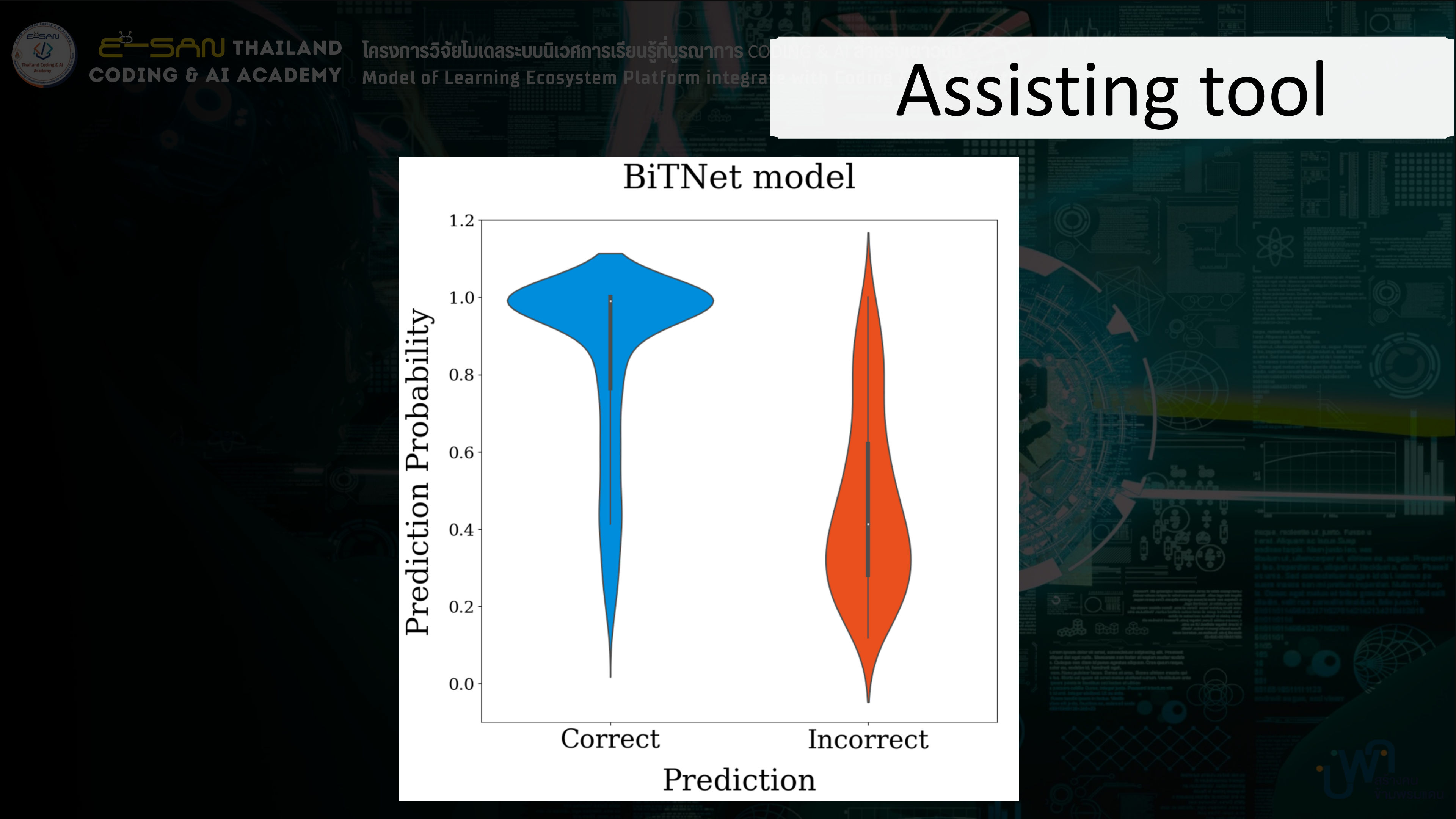
Random Forests

Random Forests

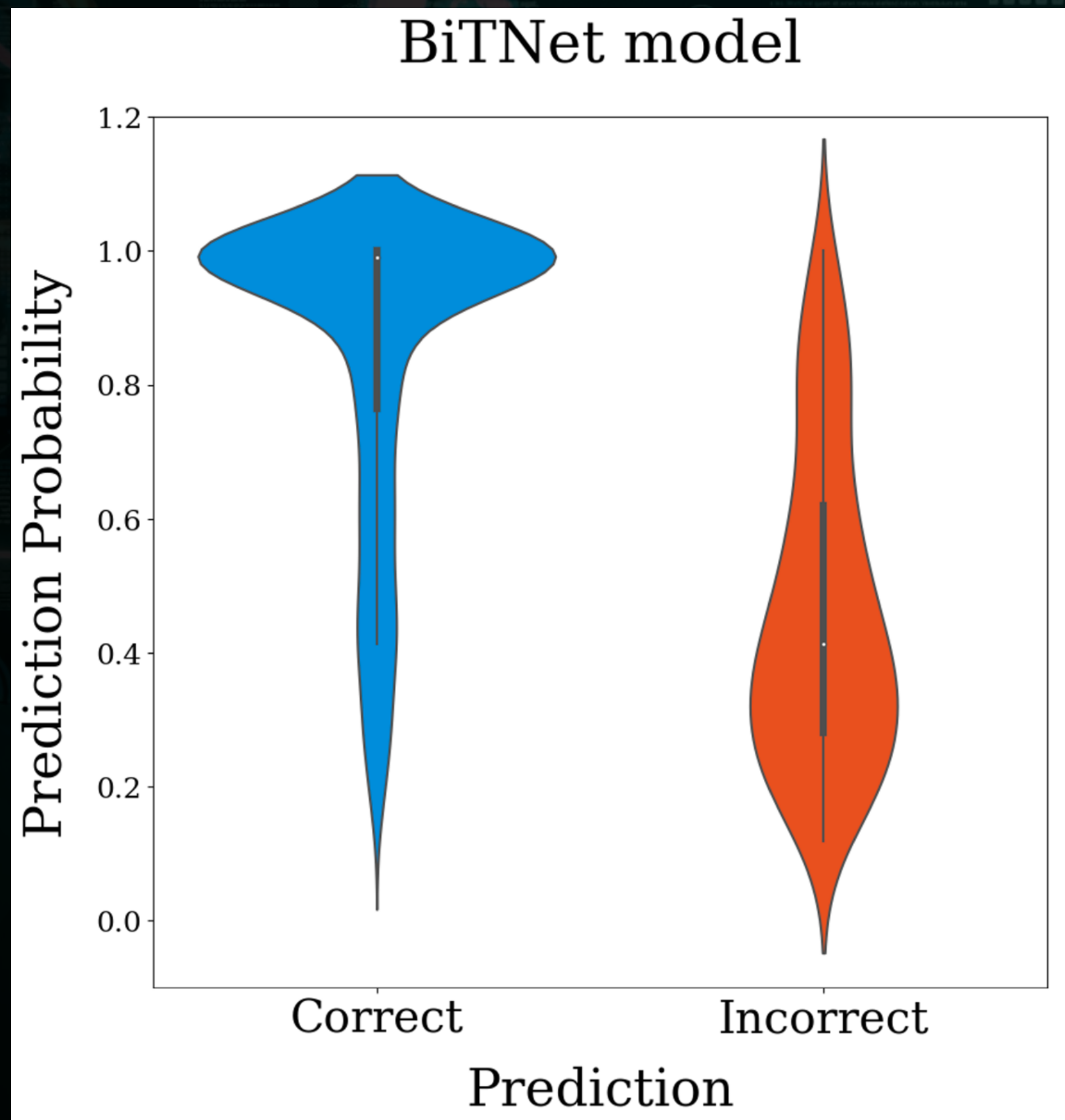
5 Viewing Angles

14Abnormality + Normal

BiTnet model

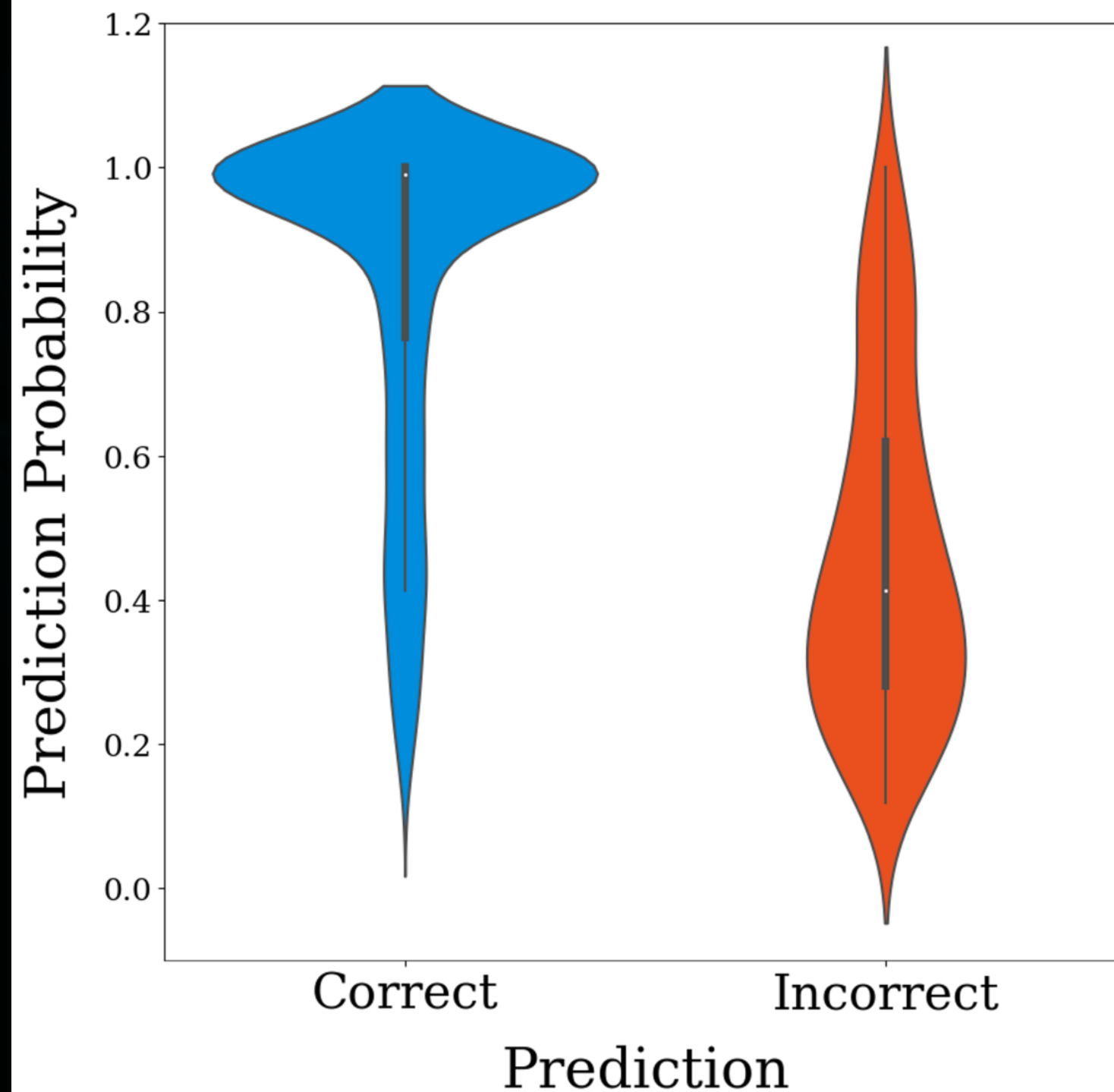


Assisting tool

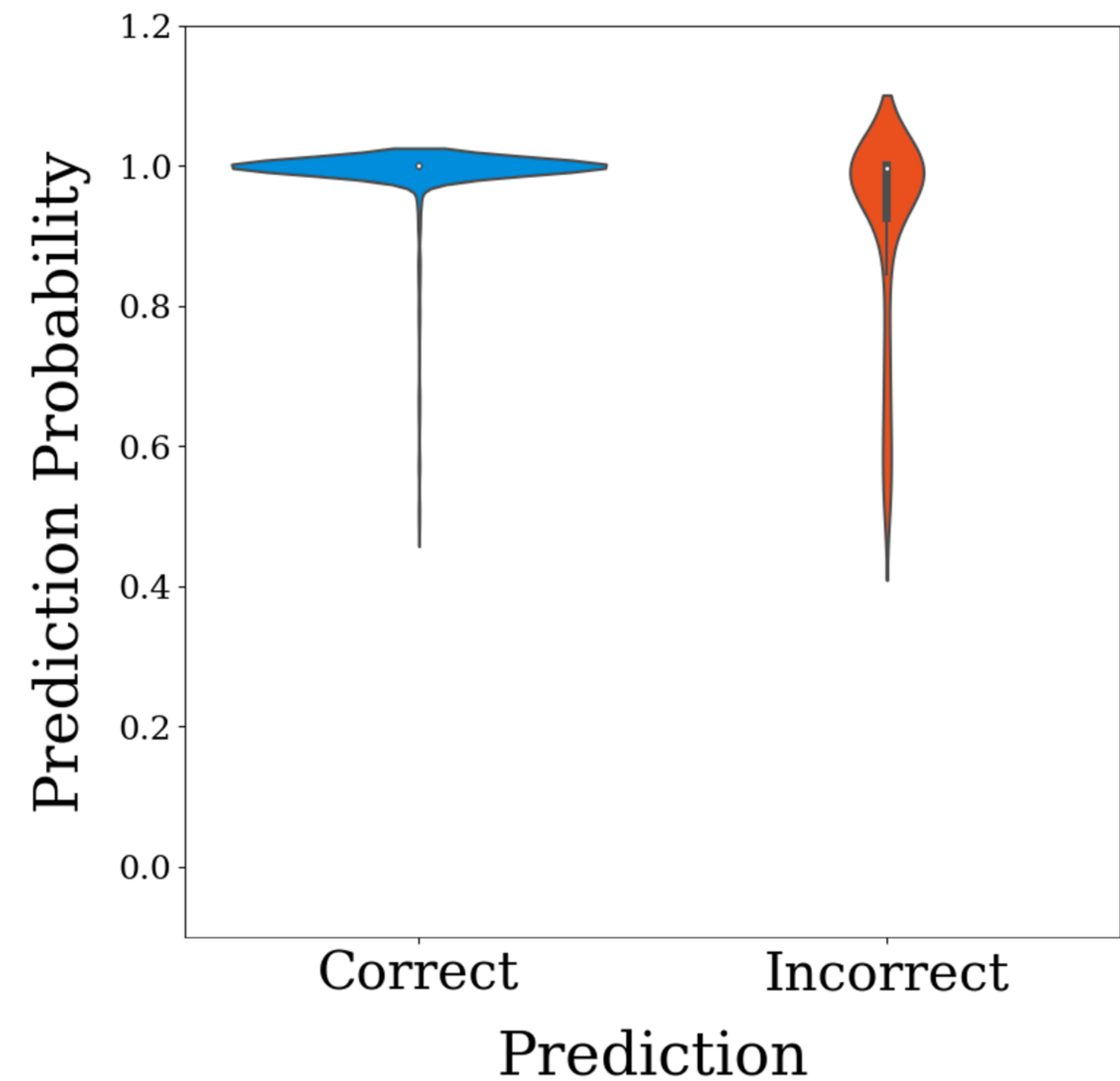


Assisting tool

BiTNet model



EfficientNet model





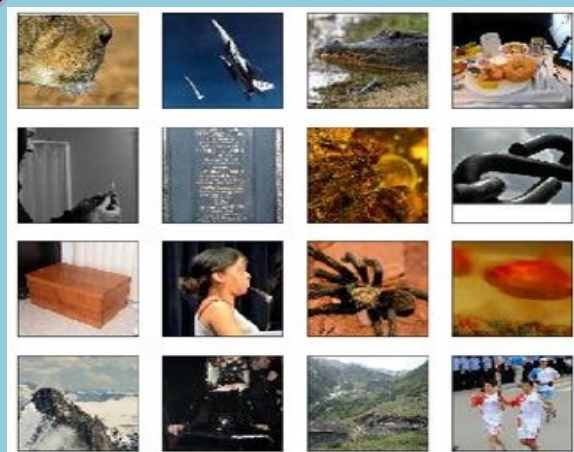
ESAN THAILAND
CODING & AI ACADEMY

โครงการวิจัยโมเดลระบบนิเวศการเรียนรู้ที่บูรณาการ CODING & AI สำหรับเยาวชน
Model of Learning Ecosystem Platform integrate with Coding & AI for Youth

More on training

Pre-trained

Load pre-trained EfficientNetB5 model



ImageNet



Deep Convolutional (Body)



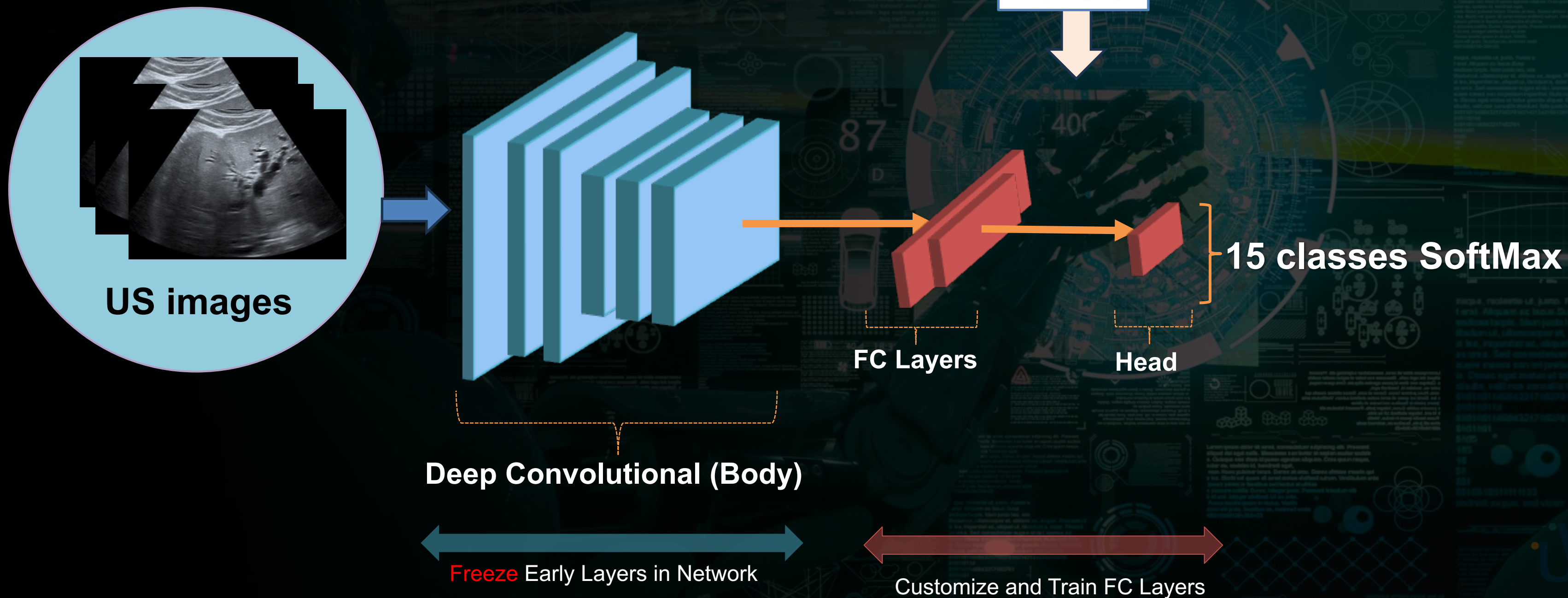
FC Layers



Head

1,000 classes SoftMax

Frozen



Unfreezed

