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

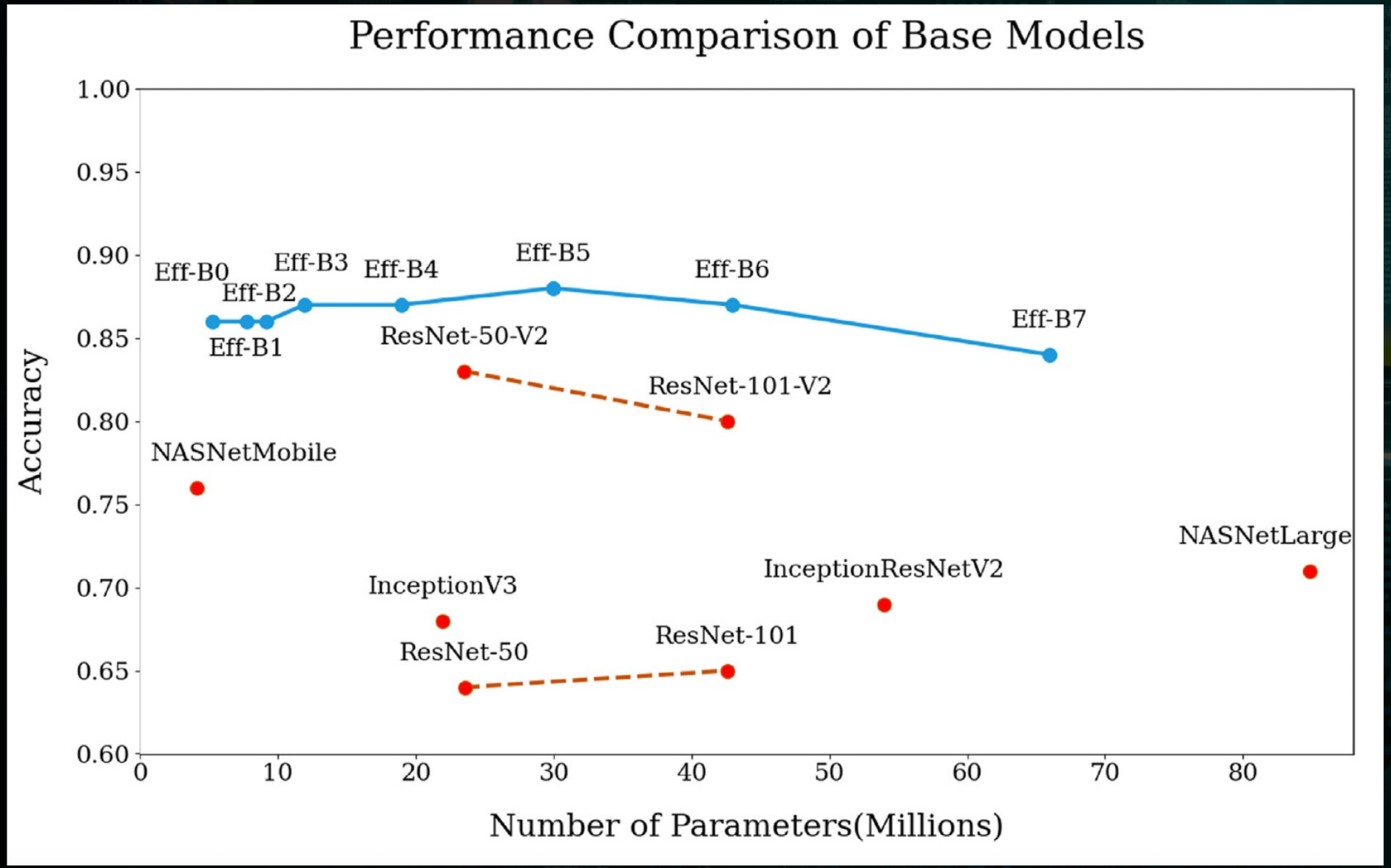
ผศ.ดร.ธนพงศ์ อินทระ

ผู้เชี่ยวชาญด้าน Computer Vision

Add a little bit of body text

Evaluation

Models


Performance Comparison of Base Models
Accuracy
Number of Parameters(Millions)
1.00
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0
10
20
30
40
50
60
70
80
Eff-B0
Eff-B1
Eff-B2
Eff-B3
Eff-B4
Eff-B5
Eff-B6
Eff-B7
ResNet-50-V2
ResNet-101-V2
NASNetMobile
NASNetLarge
InceptionV3
InceptionResNetV2
ResNet-50
ResNet-101

Models

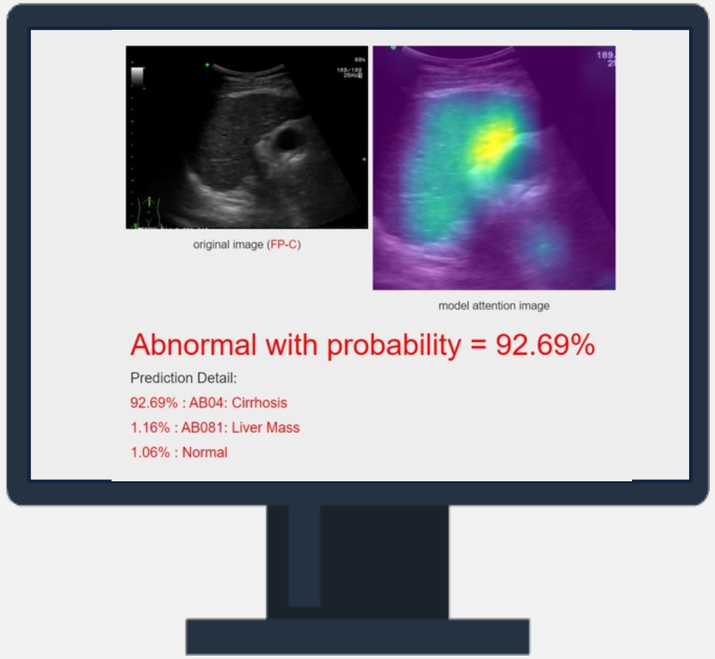
Table 2

Comparison between EfficientNet base model and BiTNet model modification on 8-fold cross-validation and the test set. The format of the numbers is *abnormality (viewing angle)*.

Model	Dataset	Accuracy	Precision	Recall	AUC
EfficientNet	Validation	0.88 (0.92)	0.79 (0.92)	0.64 (0.92)	0.74
BiTNet	Validation	0.87 (0.75)	0.79 (0.79)	0.60 (0.73)	0.82
EfficientNet	Test	0.88 (0.93)	0.82 (0.93)	0.66 (0.93)	0.79
BiTNet	Test	0.87 (0.74)	0.82 (0.80)	0.61 (0.74)	0.82

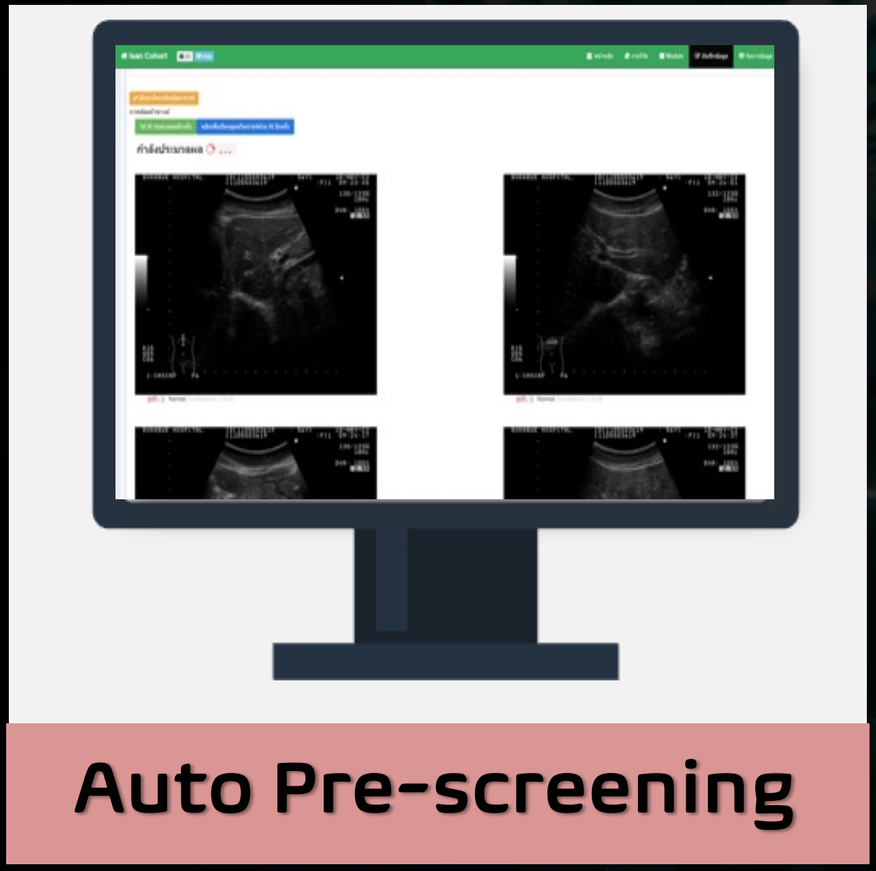
2 Applications

Auto Pre-screening

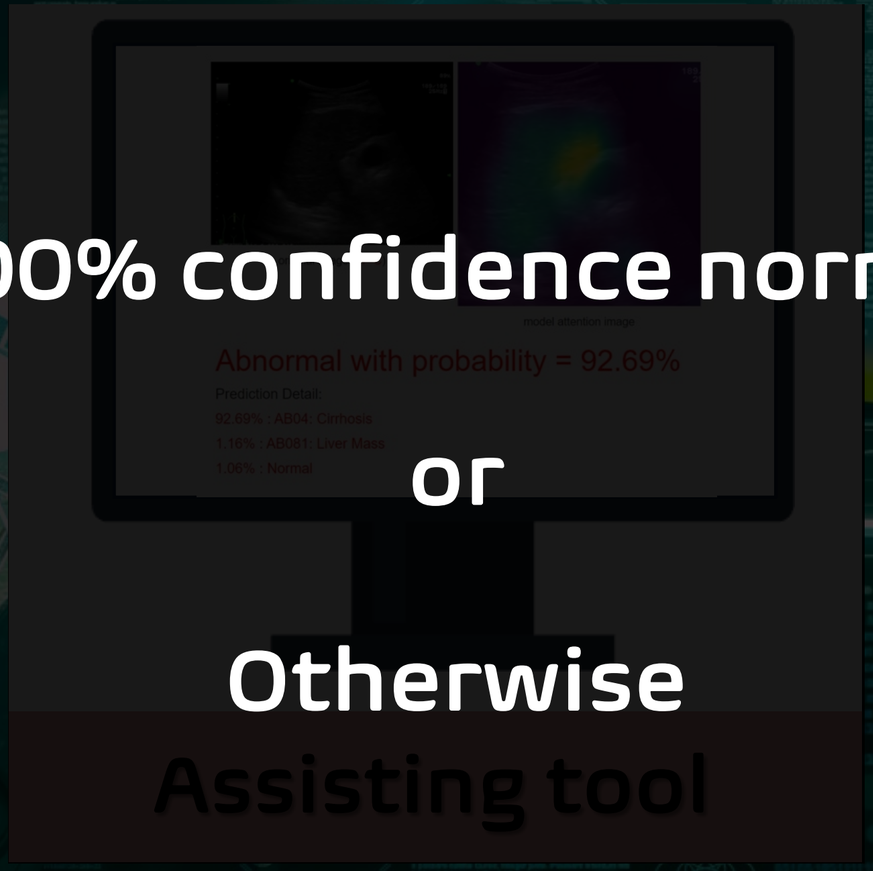


Assisting tool

1st Application



Auto Pre-screening



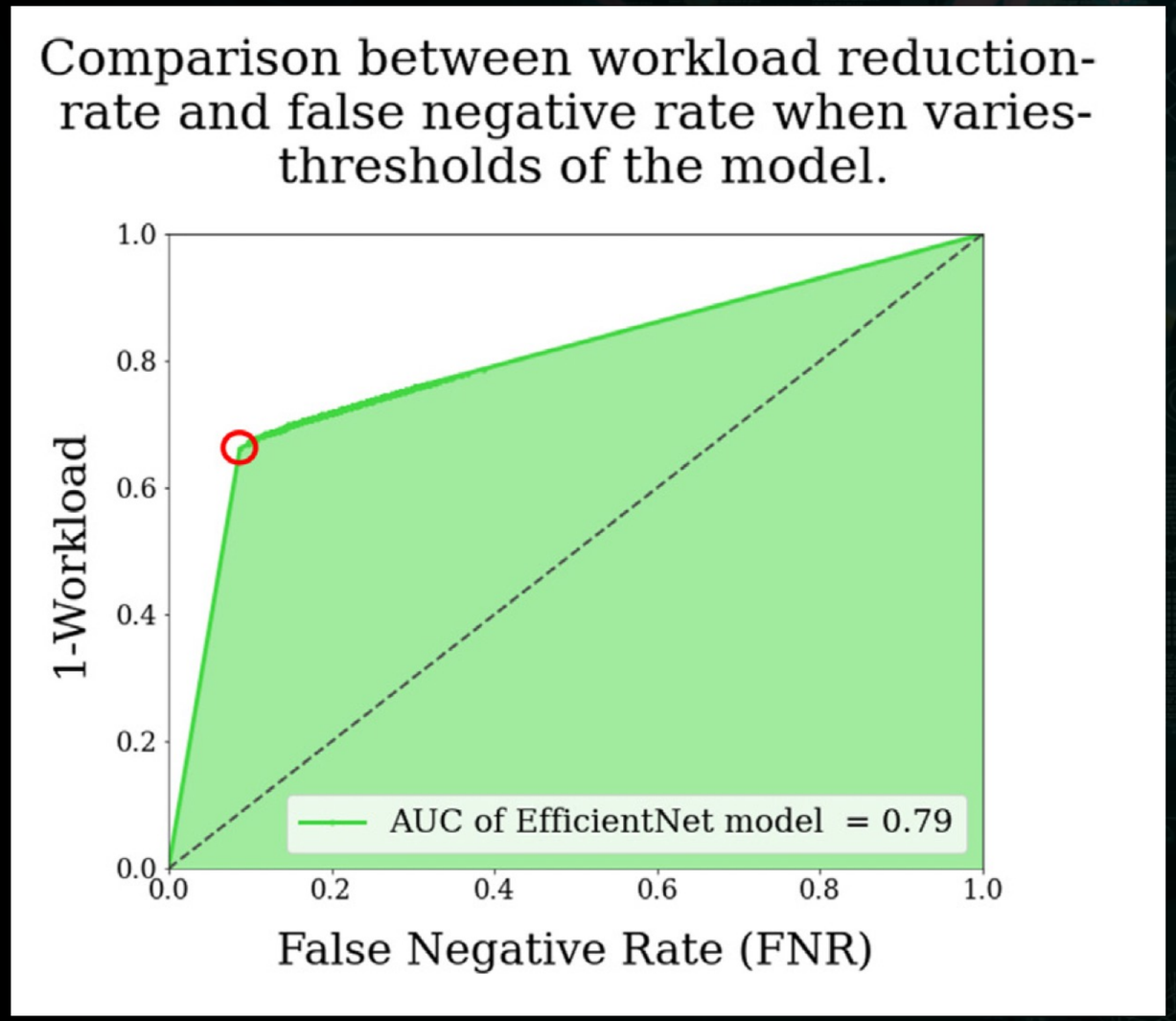
100% confidence normal

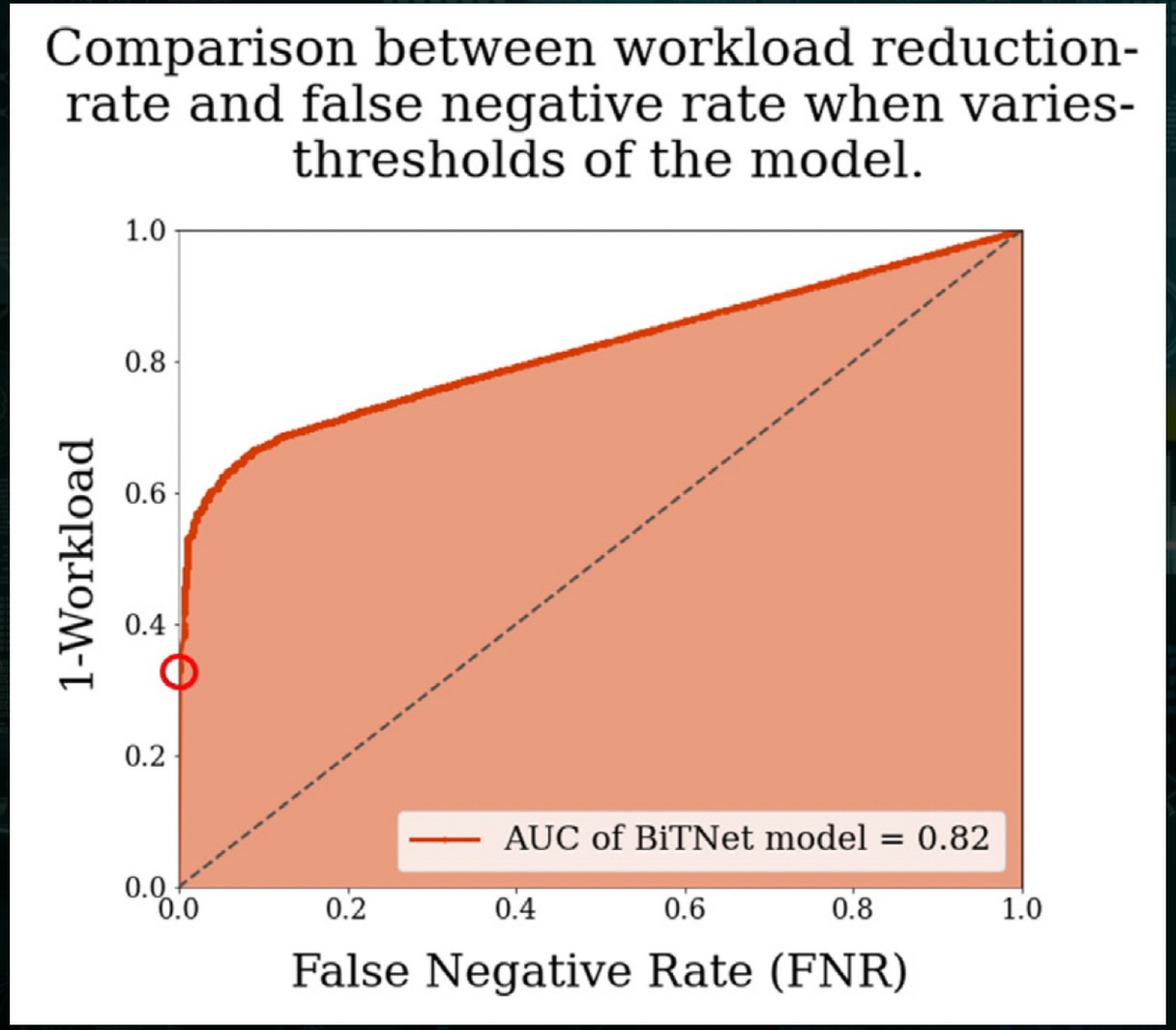
or

Otherwise

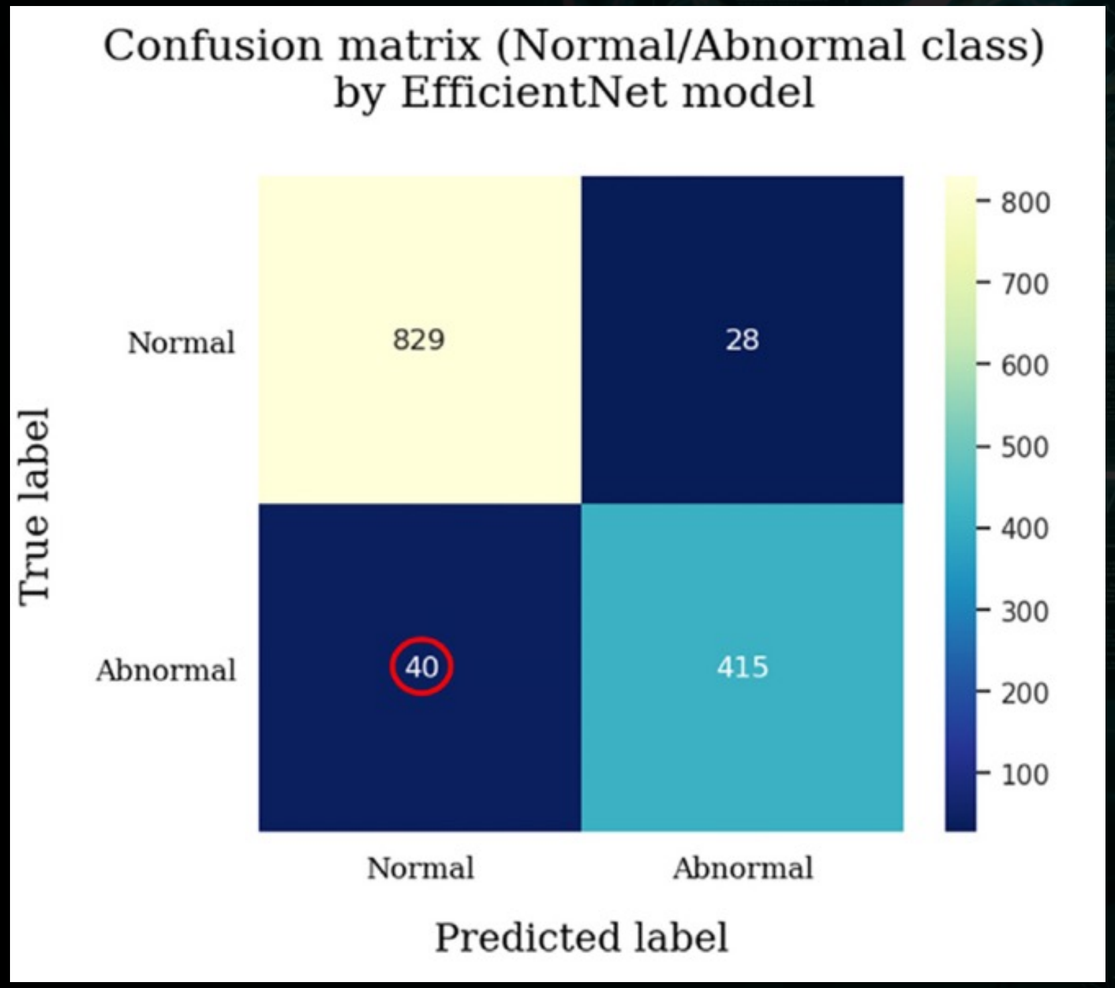
Assisting tool

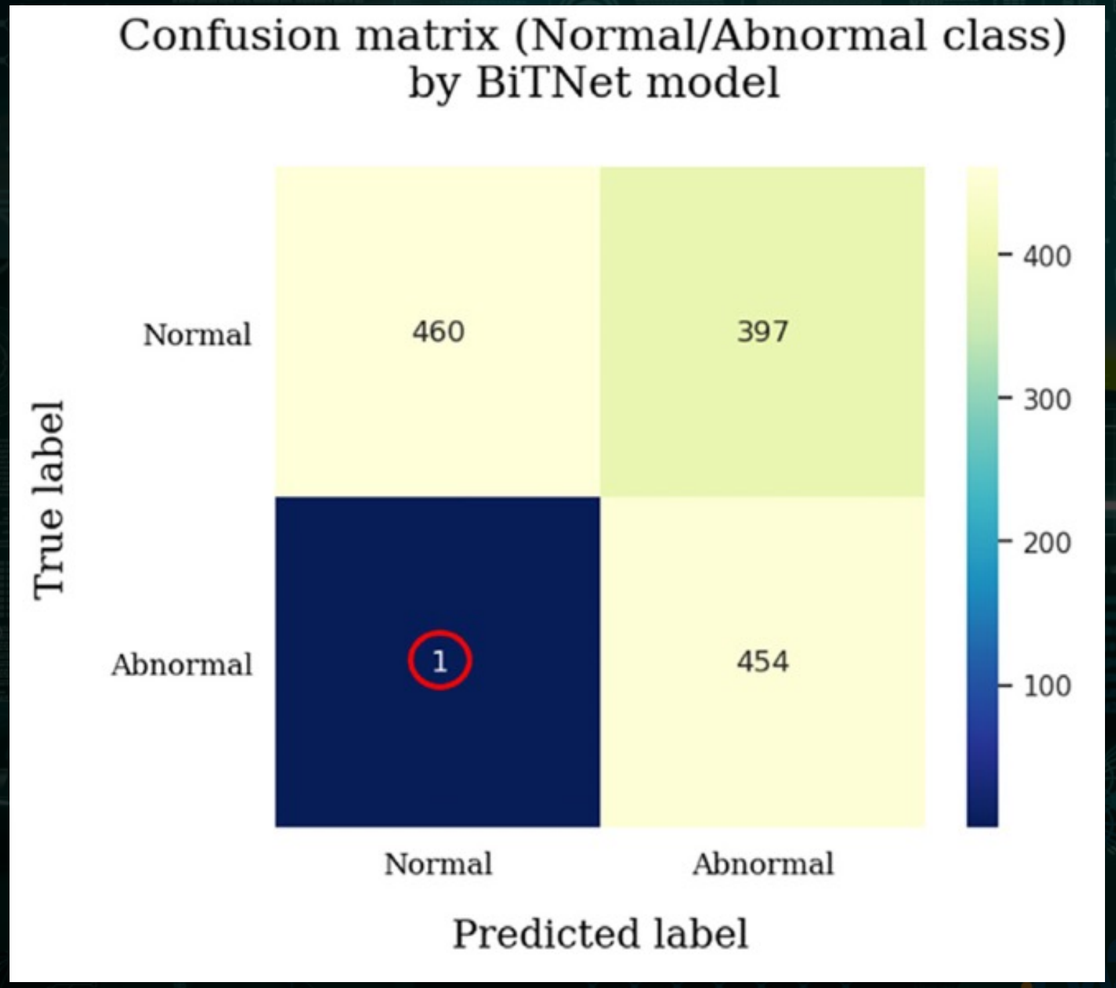
Auto Pre-screening





Auto Pre-screening





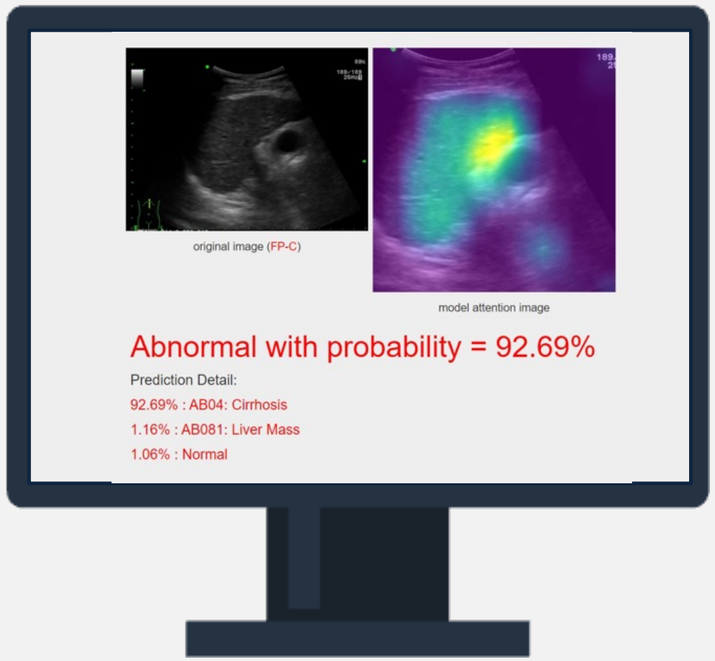
2nd Application

Predict 15 classes

+

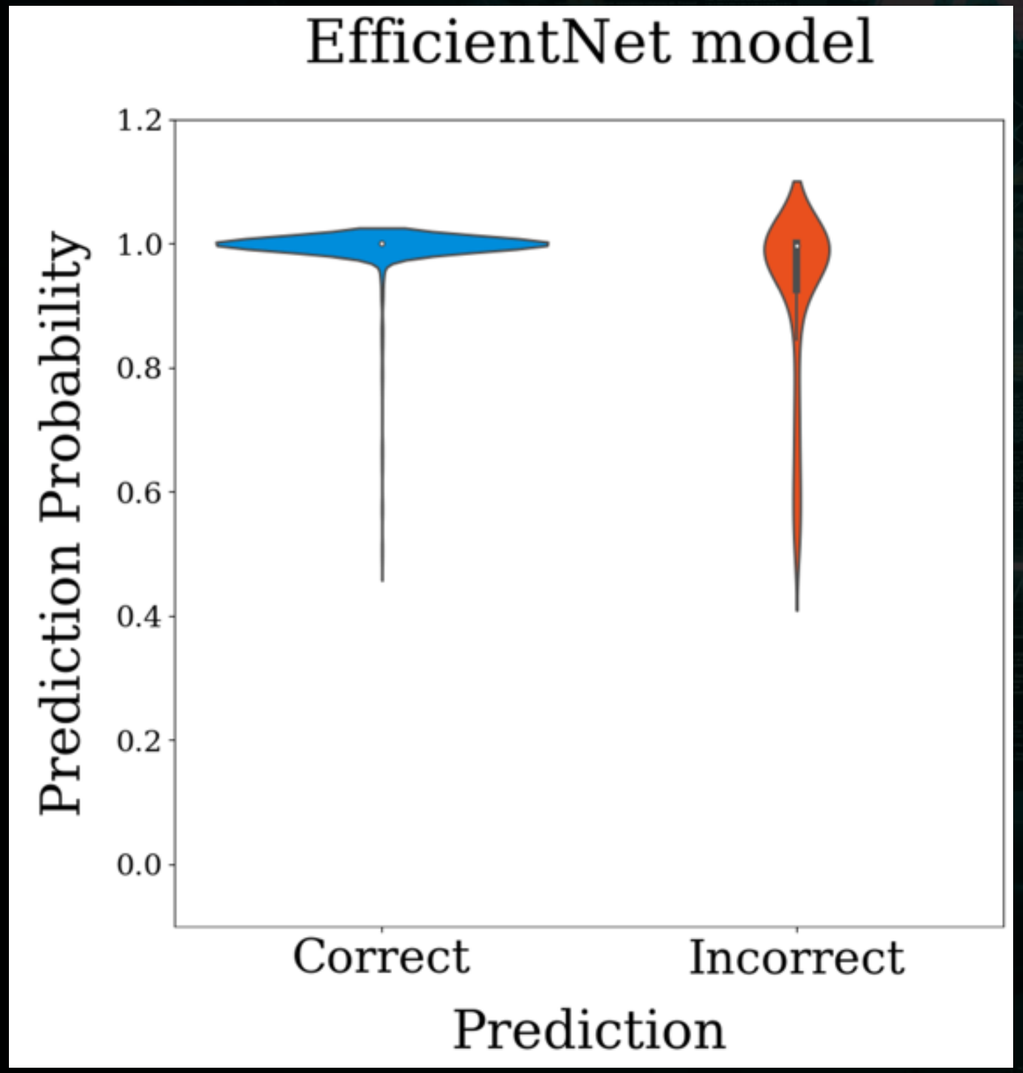
eXplanable AI

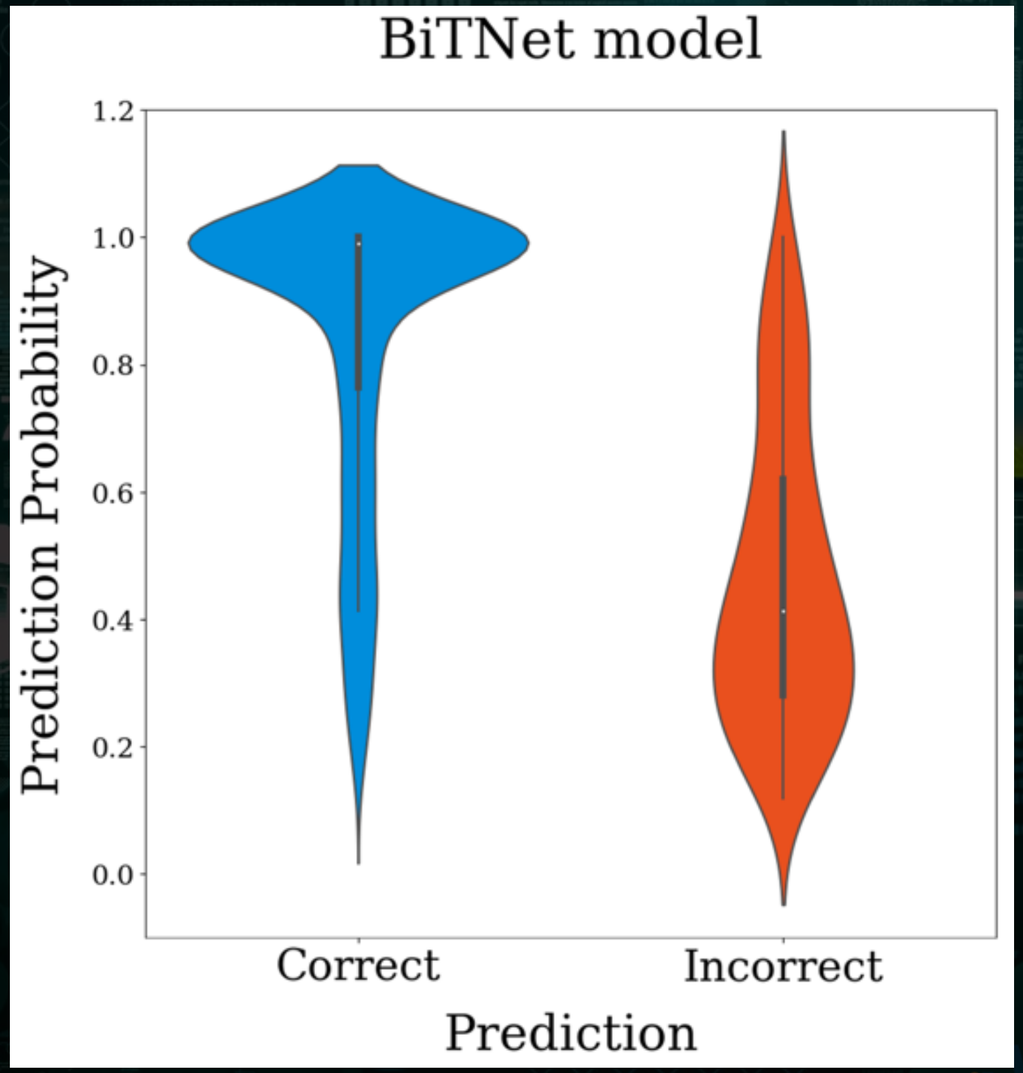
Auto Pre-screening



Assisting tool

Assisting tool



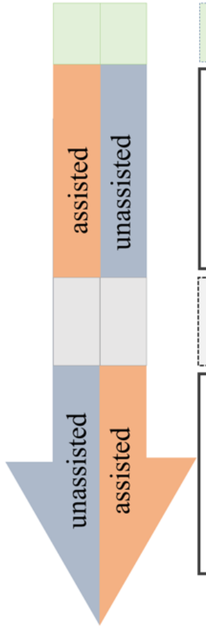


Assisting tool

Data distribution (150 test images)

	FP-A	FP-B	FP-C	FP-D	FP-E
AB01	1	1	1		
AB02	1	1	1		
AB03	1	1	1		
AB04	1	1	1	1	
AB05	1	1	1		
AB06	1	1	1		
AB07	1	1	1		
AB081	1	1	1		
AB082	1	1	1		
AB083	1	1	1		
AB09		2	1		
AB10			3		
AB11			1	2	
AB12				3	
Abnormal	**11**	**12**	**14**	**6**	**0**
Normal	**22**	**24**	**28**	**12**	**21**

Total : 150 images
Abnormal : 43 images
Normal : 107 images



Training session

Session 1:
Diagnose 150 test images

Washout Period of 4 Weeks

Session 2:
Diagnose 150 test images

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

Assisting tool

1. The **independent samples T-Test**
   - Compare the means of **mean difference** in prediction confidence of the correct and incorrect groups between the BiTNet model and the EfficientNet model.
     - Hypothesis : The means of mean differences of the BiTNet model were significantly higher than those of EfficientNet.

2. **Paired Samples T-Test**
   - Compare of mean **accuracy**, **precision**, and **recall** of the diagnostic performance of the participants with and without assistance.
     - Hypothesis : The mean accuracy, precision, and recall scores of the diagnostic performance of the participants with assistance were significantly higher than those without assistance.
   - Compare of mean accuracy between the first round of the experiment and the second round of the experiment with the participants.
     - Hypothesis : The mean accuracy scores no significant difference between the first round and the second round of the experiment.
   - Compare of mean similarity scores between AI suggestion (prediction) and the final decision of the participants when assisted/unassisted.
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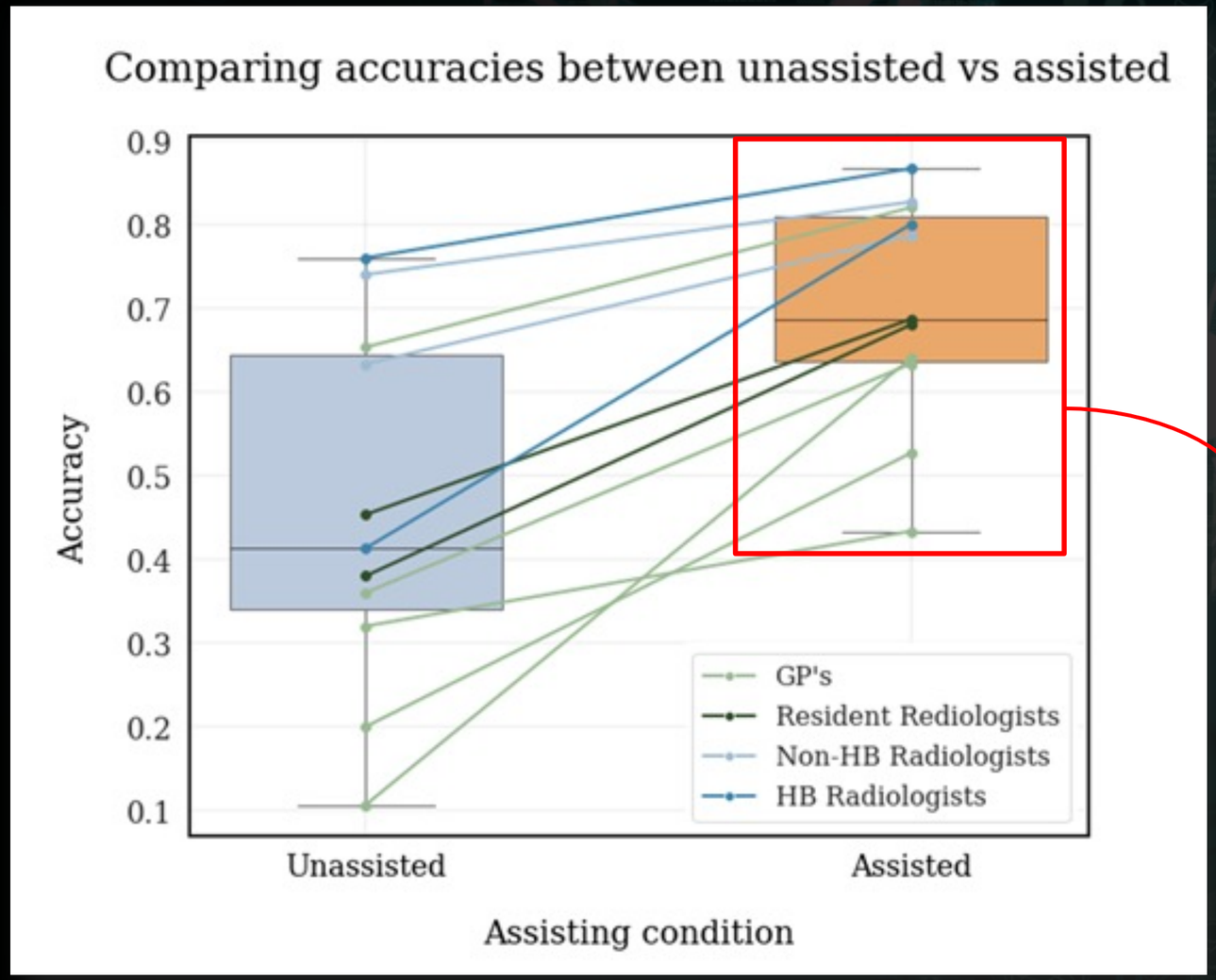
Assisting tool

Table 3
Comparison of mean accuracy, precision, and recall of assisted vs unassisted diagnosis with 99% confidence interval.

Metric	Assisted	Unassisted	*p*-value
Accuracy	0.74 ± 0.13	0.50 ± 0.23	3.44×10^{-4} [a]
Precision	0.62 ± 0.15	0.46 ± 0.16	1.58×10^{-4} [a]
Recall	0.94 ± 0.07	0.85 ± 0.06	0.05

[a] indicates p-value < 0.05.

Assisting tool



increase overall's accuracy by 18%

increase GP's accuracy by 26%








สร้างคน
ข้ามพรมแดน

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ESAN
Thailand Coding & AI
Academy

คณะศึกษาศาสตร์ มหาวิทยาลัยขอนแก่น
FACULTY OF EDUCATION KHON KAEN UNIVERSITY
1968

มหาวิทยาลัยขอนแก่น

สอวช
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