



BÁO CÁO PROJECT

NeuralTrans



"ISIC - 2018 - Task 3"

X

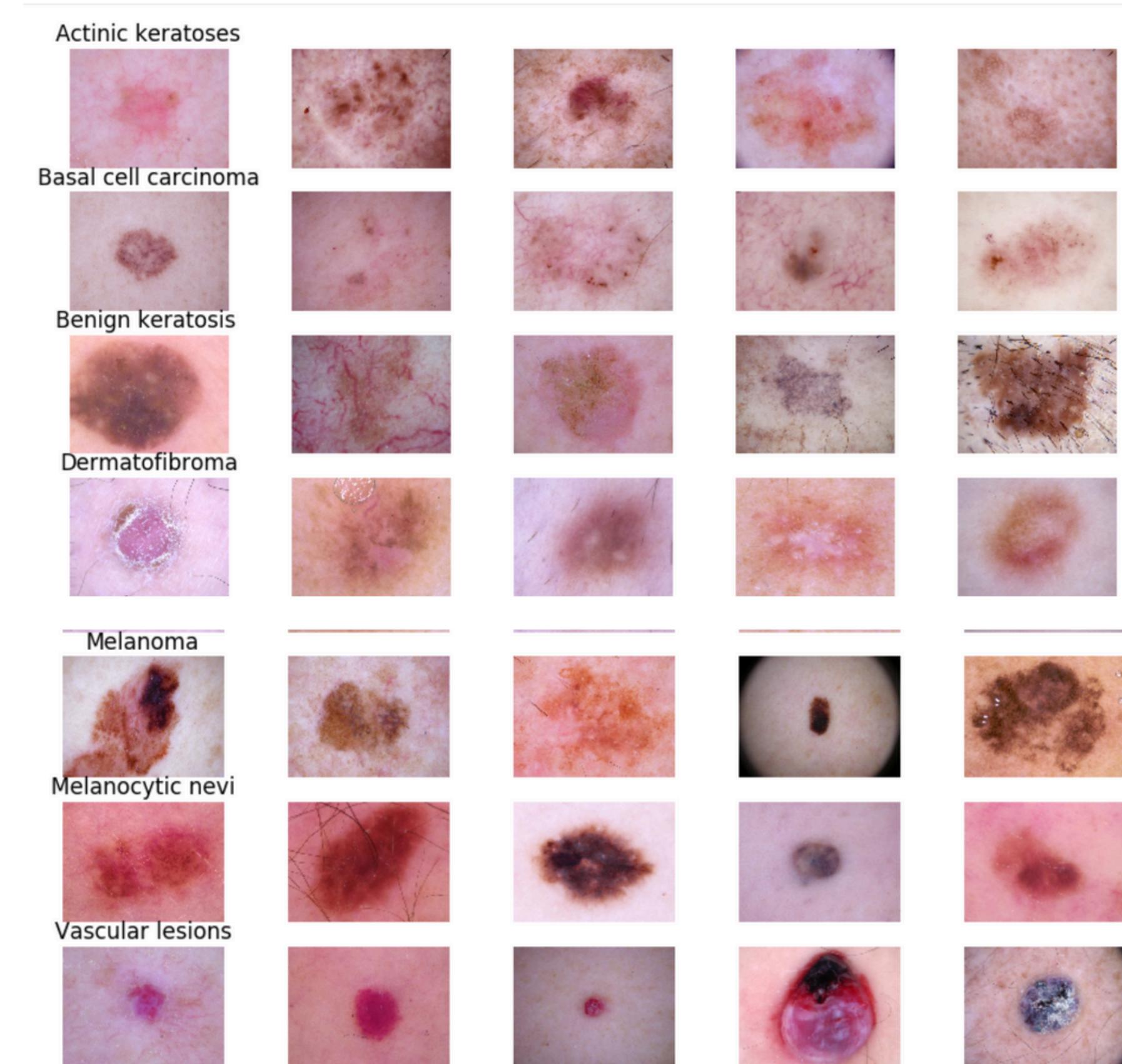
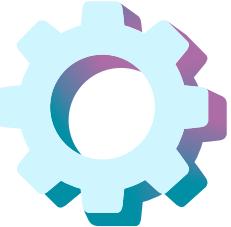
Computer Vision
Nguyễn Bá Thành



TỔNG QUAN

- ÁC TÍNH
 - TIỀN UNG THƯ
 - LÀNH TÍNH
-
- | | | |
|---------|-----------------------------|------------|
| ○ MEL | MELANOMA | 11% |
| ○ NV | MELANOCYTIC NEVUS | 67% |
| ○ BCC | BASAL CELL CARCINOMA | 5% |
| ○ AKIEC | ACTINIC KERATOSIS | 3% |
| ○ BKL | BENIGN KERATOSIS | 11% |
| ○ DF | DERMATOFIBROMA | 1% |
| ○ VASC | VASCULAR LESION | 1% |

ISIC - 2018 - TASK 3 PHÂN BIỆT BỆNH DA LIỄU



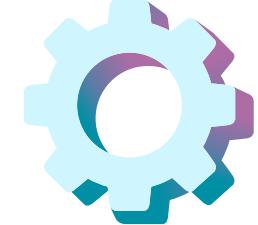
MỤC TIÊU: XÂY DỰNG HỆ
THỐNG PHÂN LOẠI TỔN
THƯƠNG DA 7 LOẠI BỆNH





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PHÂN BIỆT BỆNH DA LIỄU



- **TRAINING SET: 10,015 IMAGES**
- **VALIDATE SET: 193 IMAGES**
- **TEST SET : 1,512 IMAGES**

[NGUỒN: HAM10000 DATASET](#)

[MEDICAL UNIVERSITY OF VIENNA & MSK](#)

Train dataset size: 10015
Val dataset size: 193
Test dataset size: 1512
Using WeightedRandomSampler for balanced sampling

Batch size: 32
Train batches: 313
Val batches: 7
Test batches: 48

==== TRAIN DATASET ==== === VAL DATASET === === TEST DATASET ===
Total samples: 10015 Total samples: 193 Total samples: 1512

Label distribution:

AKIEC: 327 (3.27%)
BCC: 514 (5.13%)
BKL: 1099 (10.97%)
DF: 115 (1.15%)
MEL: 1113 (11.11%)
NV: 6705 (66.95%)
VASC: 142 (1.42%)

Label distribution:

AKIEC: 8 (4.15%)
BCC: 15 (7.77%)
BKL: 22 (11.40%)
DF: 1 (0.52%)
MEL: 21 (10.88%)
NV: 123 (63.73%)
VASC: 3 (1.55%)

Label distribution:

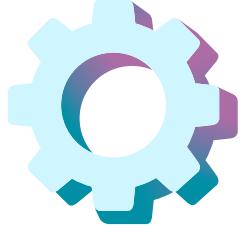
AKIEC: 43 (2.84%)
BCC: 93 (6.15%)
BKL: 217 (14.35%)
DF: 44 (2.91%)
MEL: 171 (11.31%)
NV: 909 (60.12%)
VASC: 35 (2.31%)





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PHÂN BIỆT BỆNH DA LIỄU



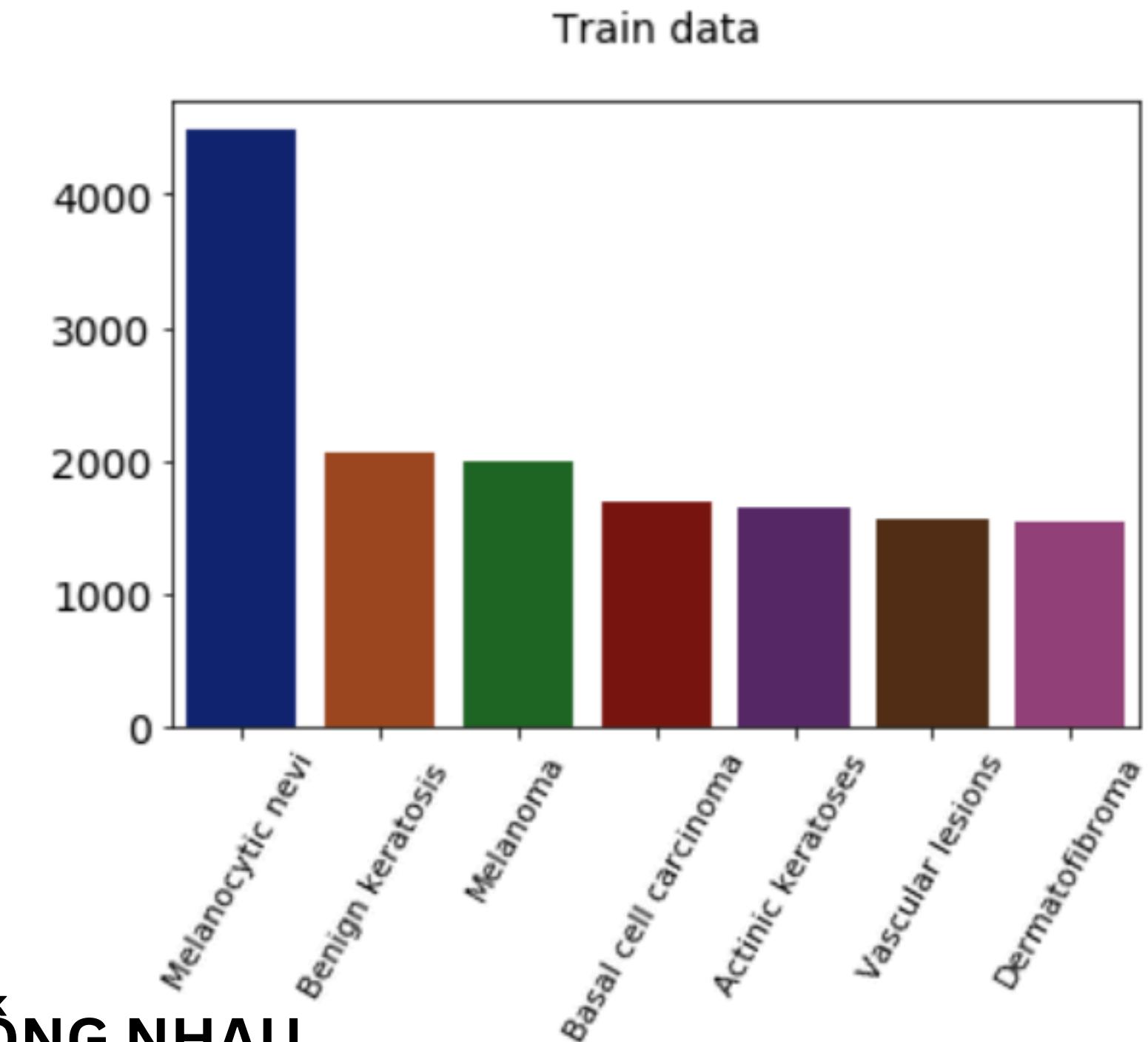
- TRAINING SET: 10,015 IMAGES
- VALIDATE SET: 193 IMAGES
- TEST SET : 1,512 IMAGES

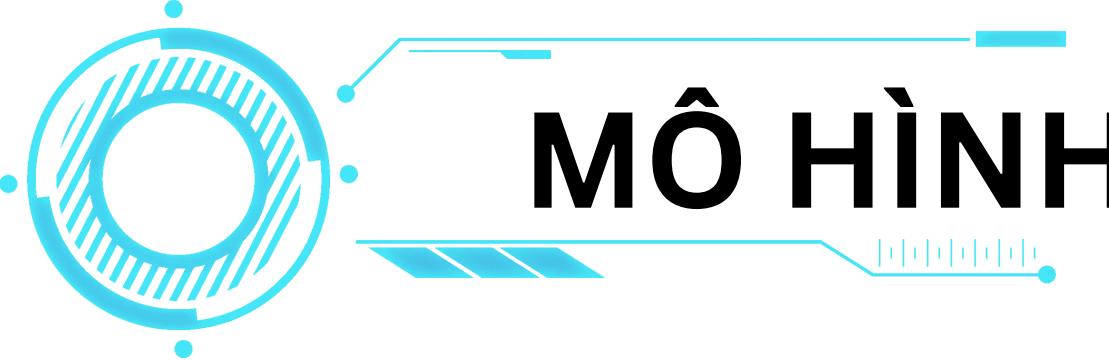
NGUỒN: HAM10000 DATASET

MEDICAL UNIVERSITY OF VIENNA & MSK

THÁCH THỨC

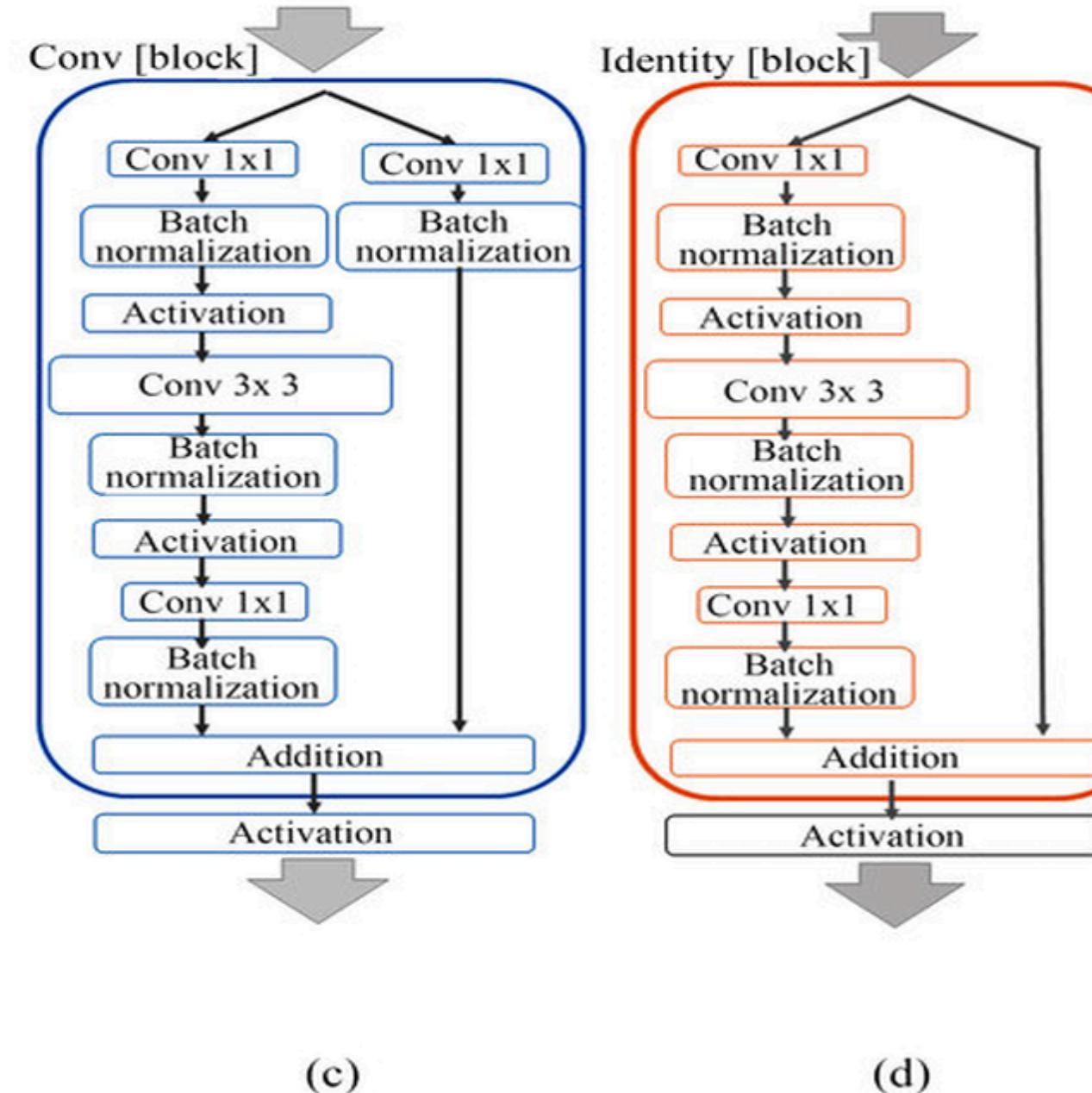
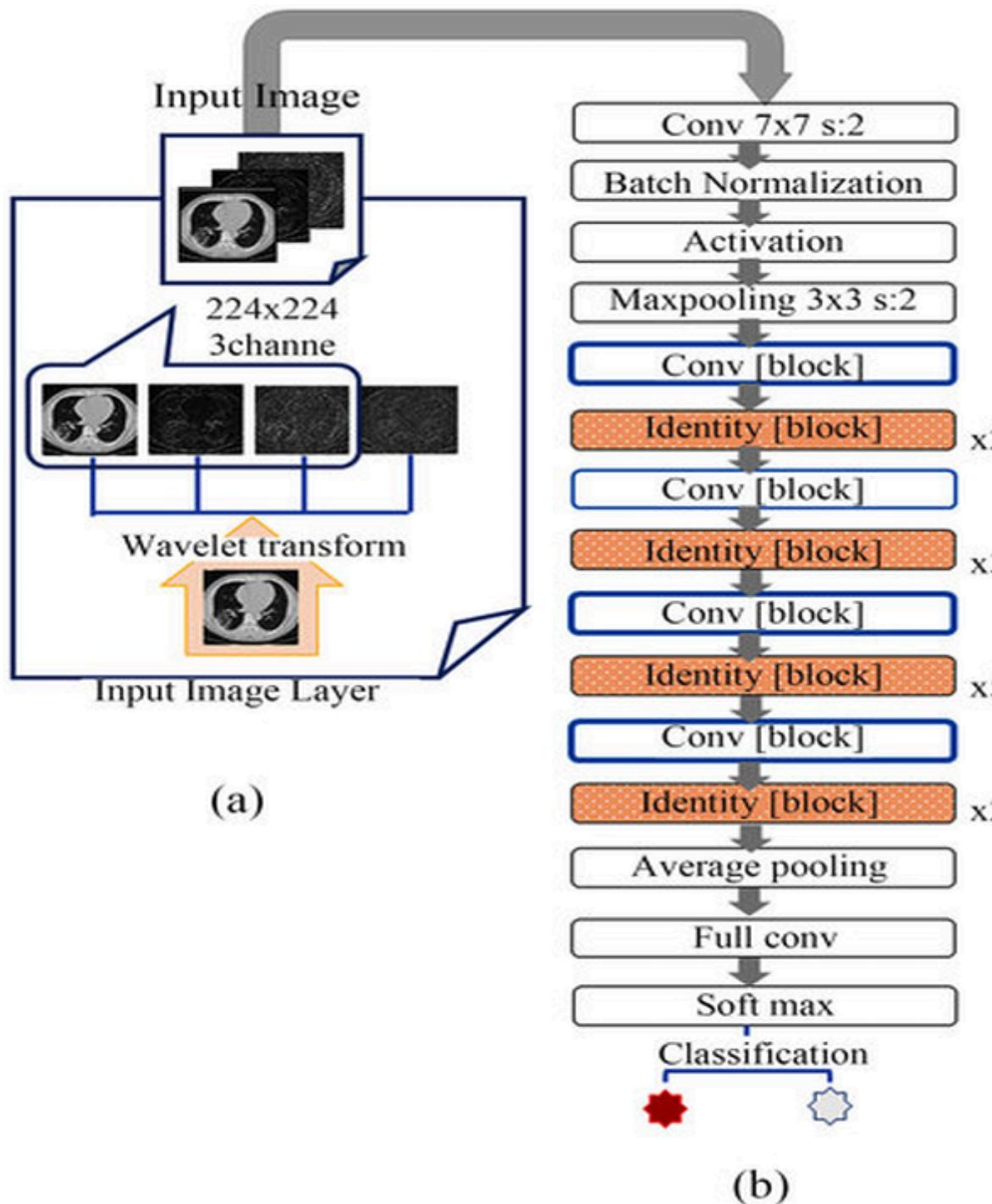
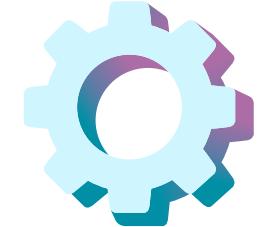
- CLASS IMBALANCE: CHÊNH LỆCH LỚN
- INTER CLASS SIMILARITY: KHÁC BỆNH, BIỂU HIỆN GIỐNG NHAU
- INTRA CLASS VARIATION: CÙNG BỆNH, BIỂU HIỆN ĐA DẠNG
- NOISE: LÔNG, PHẢN CHIẾU VÀ ARTIFACTS TỪ THIẾT BỊ





MÔ HÌNH

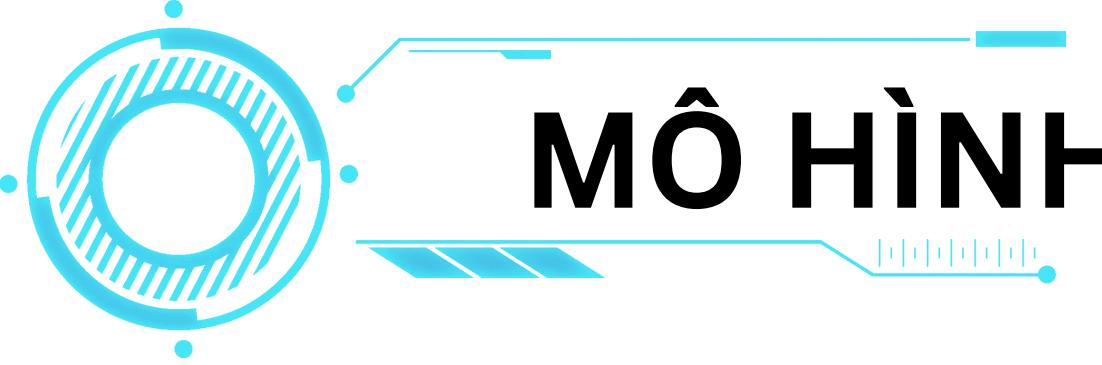
ISIC - 2018 - TASK 3 PHÂN BIỆT BỆNH DA LIỄU



- ACCURACY: 76%
- PARAMETERS: 26M
- FLOPS: 4.1B

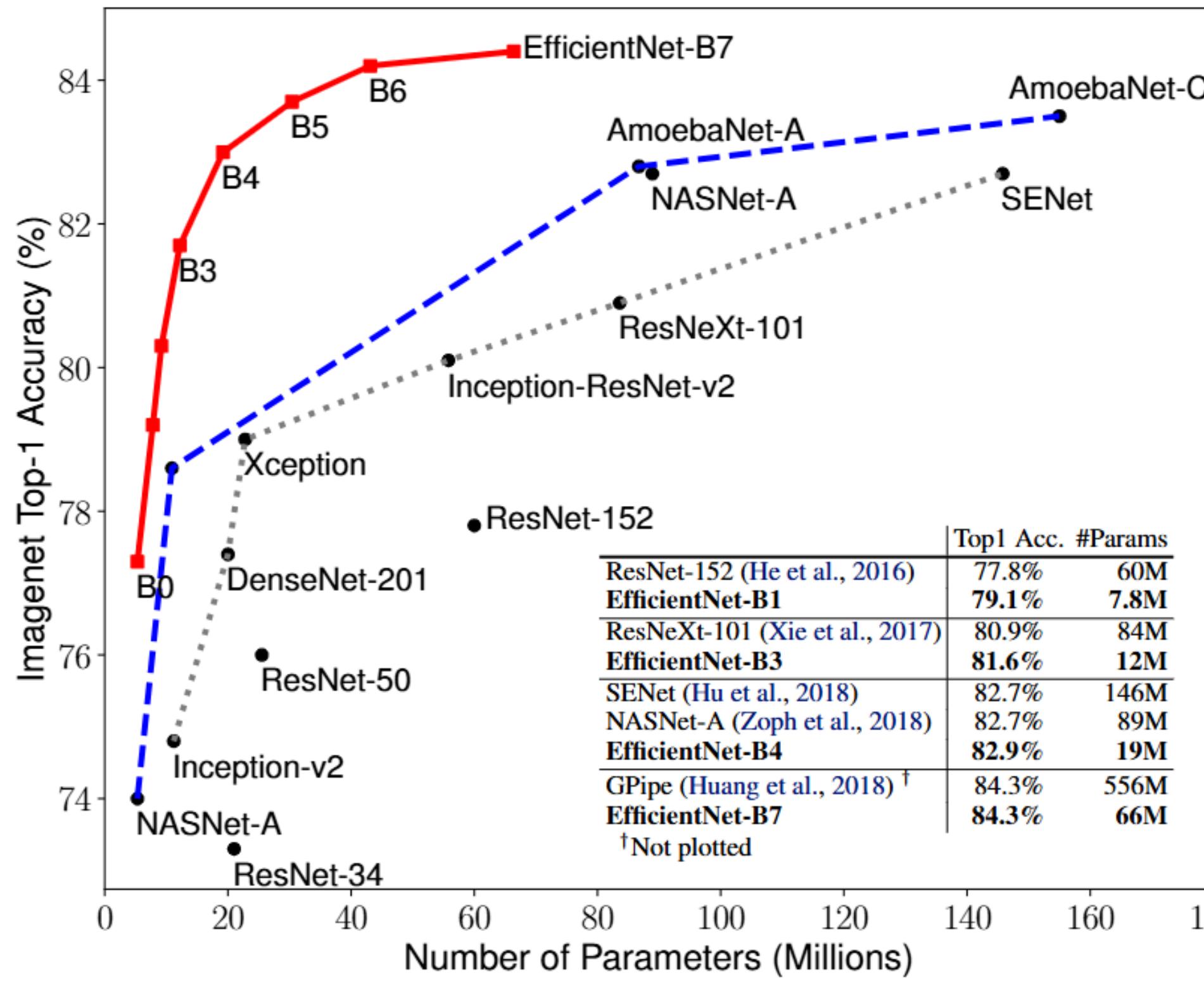
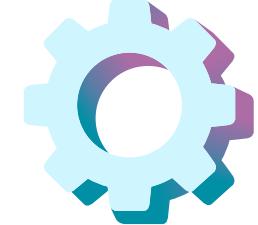
RESNET50





ISIC - 2018 - TASK 3

PHÂN BIỆT BỆNH DA LIỄU



RESNET 50

- ACCURACY: 76%
- PARAMETERS: 26M
- FLOPS: 4.1B

EFFICIENTNET B3

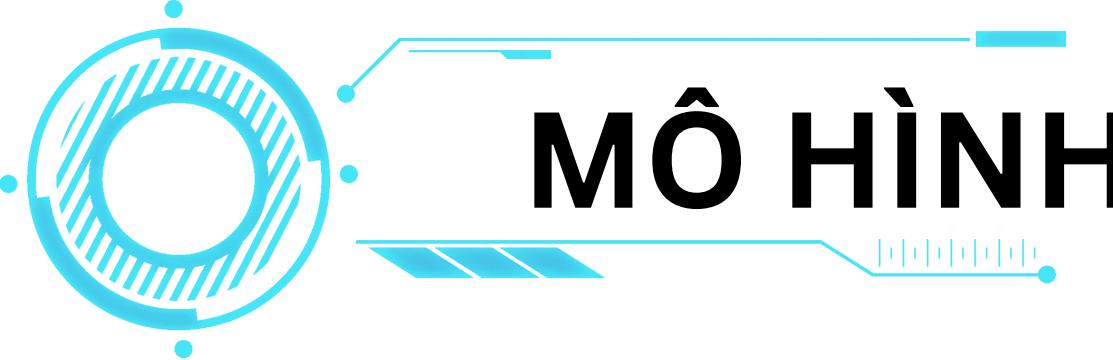
- ACCURACY: 81.6%
- PARAMETERS: 12M
- FLOPS: 1.8B

CHỌN EFFICIENT NET B3 VÌ

- ĐỘ CHÍNH XÁC CAO
- ÍT TÀI NGUYÊN
- NHANH HƠN
- LÝ TƯỞNG CHO DATA PHÚC TẠP

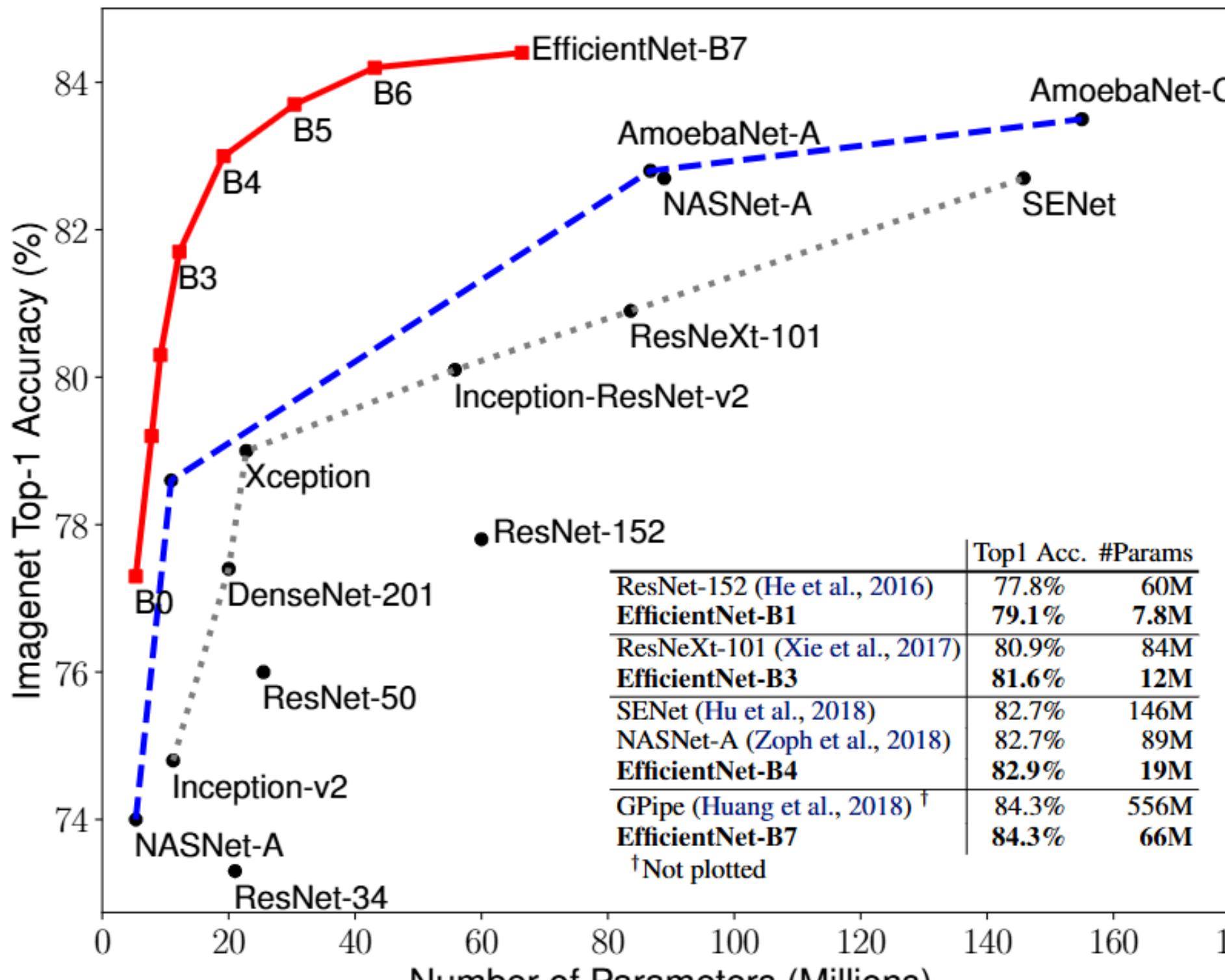
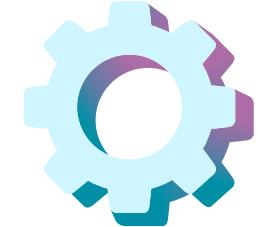


NUMBER OF PARAMETER



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PHÂN BIỆT BỆNH DA LIỄU



NUMBER OF PARAMETER

TẠI SAO KHÔNG DÙNG B7 THAY VÌ B3 ?

EFFICIENTNET B7

- ACCURACY: 84.3%
- PARAMETERS: 66M
- FLOPS: 37B

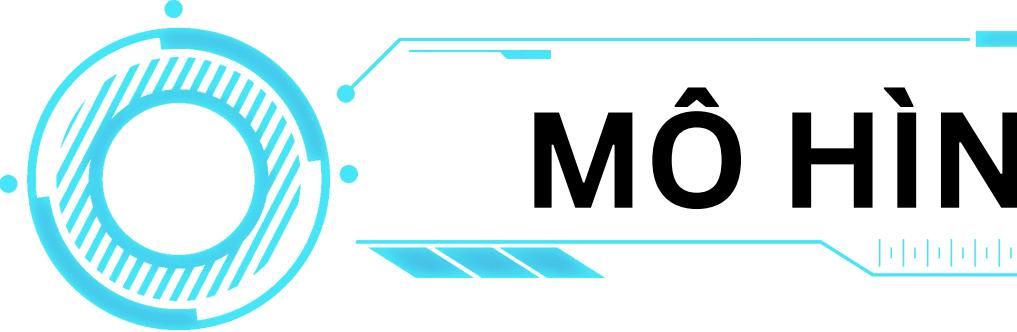
EFFICIENTNET B3

- ACCURACY: 81.6%
- PARAMETERS: 12M
- FLOPS: 1.8B

CHỌN EFFICIENT NET B3 VÌ

- DATASET 10K: B7 DỄ OVERFIT
- B7 > 5.5 PARA B3; B7 > 20 FLOPS B3
- TỐN NHIỀU NGÀY ĐỂ TRAIN
- B7 CẦN GPU MẠNH

• TỐI ƯU: B3 + DATA AUGMENTATION + ENSEMBLE



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PHÂN BIỆT BỆNH DA LIỄU

