COMBINING EFFICIENTBET AND VISION TRANSFORMERS FOR VIDEO DEEPFAKE DETECTION

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2021.08.05

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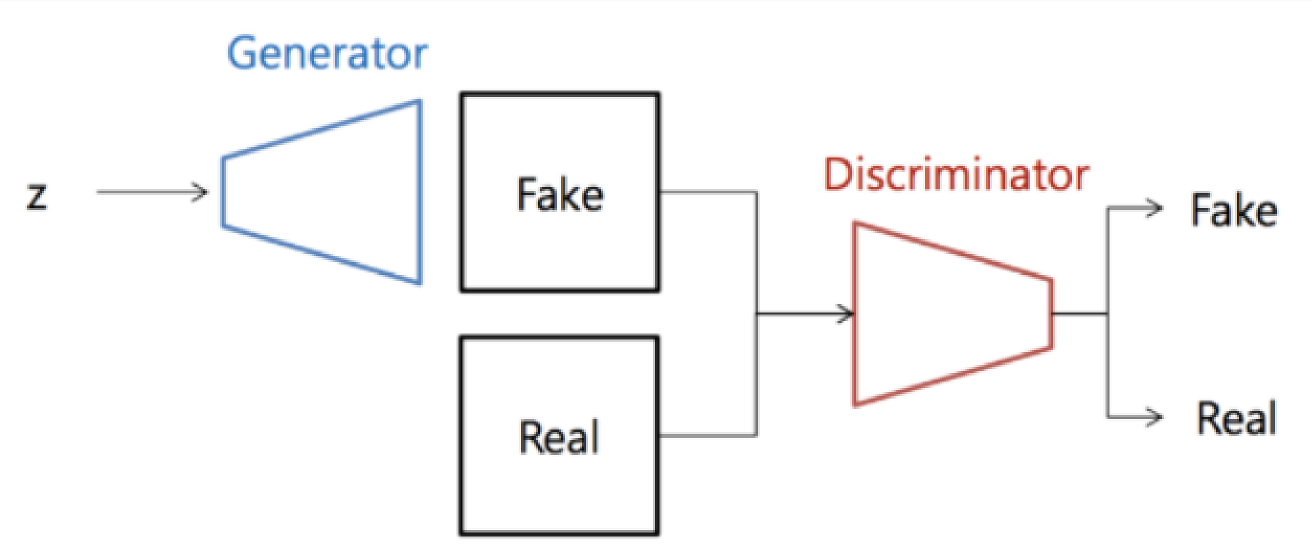
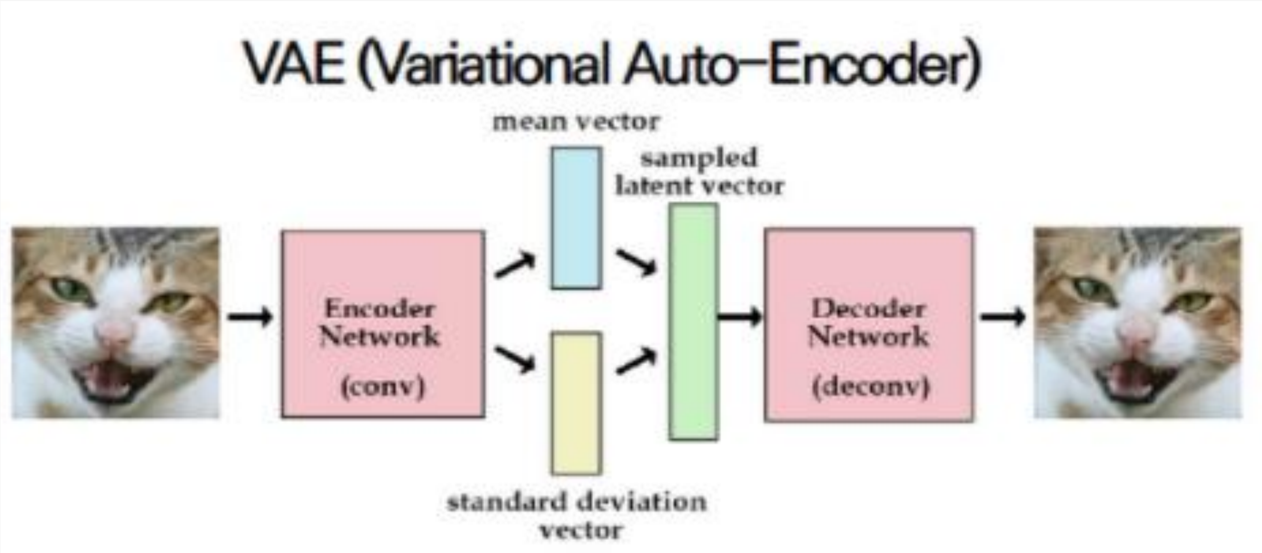
신우정

Deepfake

1. GAN (Generative Adversarial Network)



2. VAE (Variational AutoEncoder)



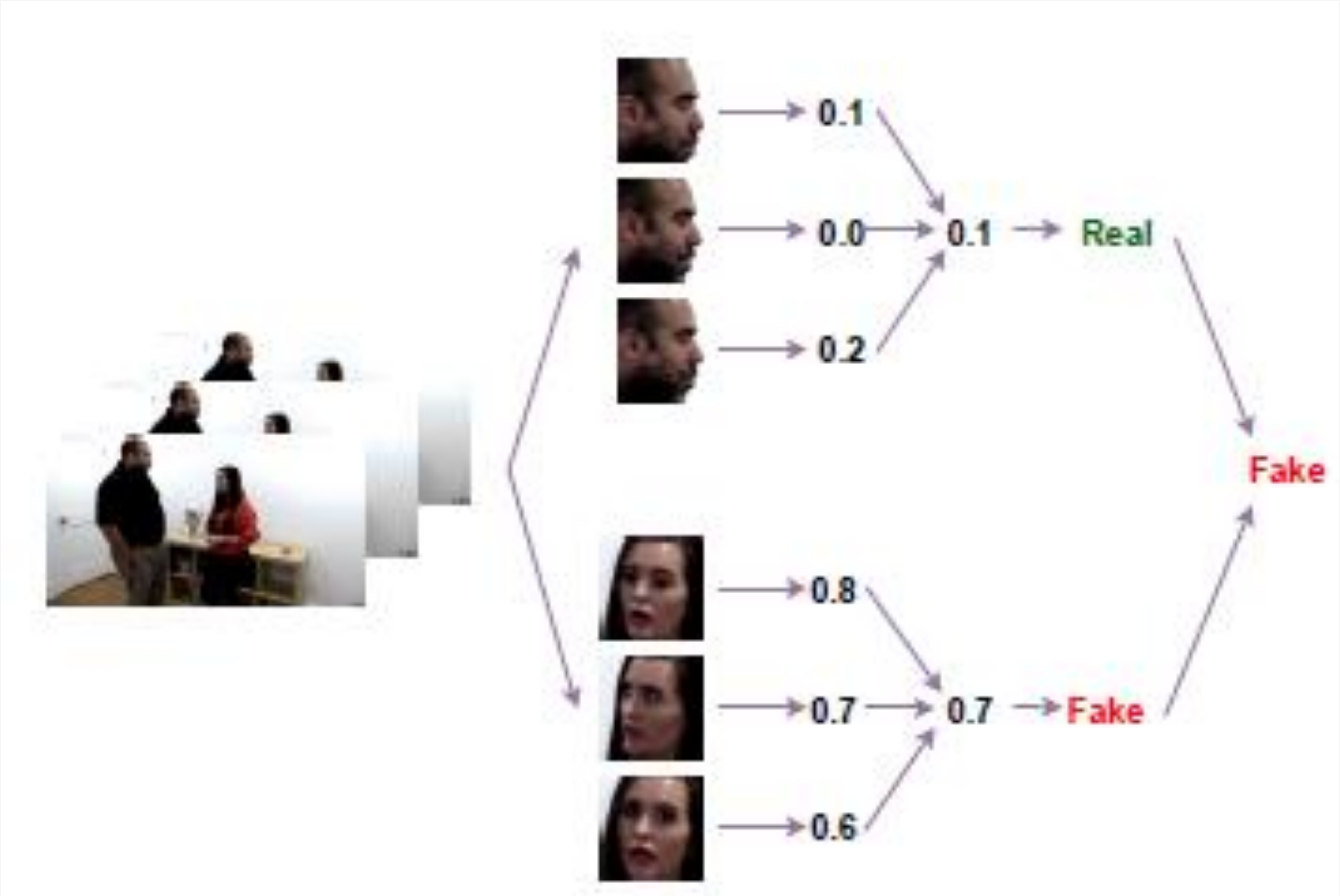
https://www.creativebloq.com/features/deepfake-examples
https://ratsgo.github.io/generative%20model/2017/12/20/gan/
https://velog.io/@ohado/%EB%94%A5%EB%9F%AC%EB%8B%9D-%EA%B0%9C%EB%85%90-1.-VAEVariational-Auto-Encoder

Experiments

<Dataset>
- FaceForensics++
- DFDC dataset

<Training>
- SGD optimizer
- Learning rate -> 0.01

<Inference>
Real/Fake threshold -> 0.55



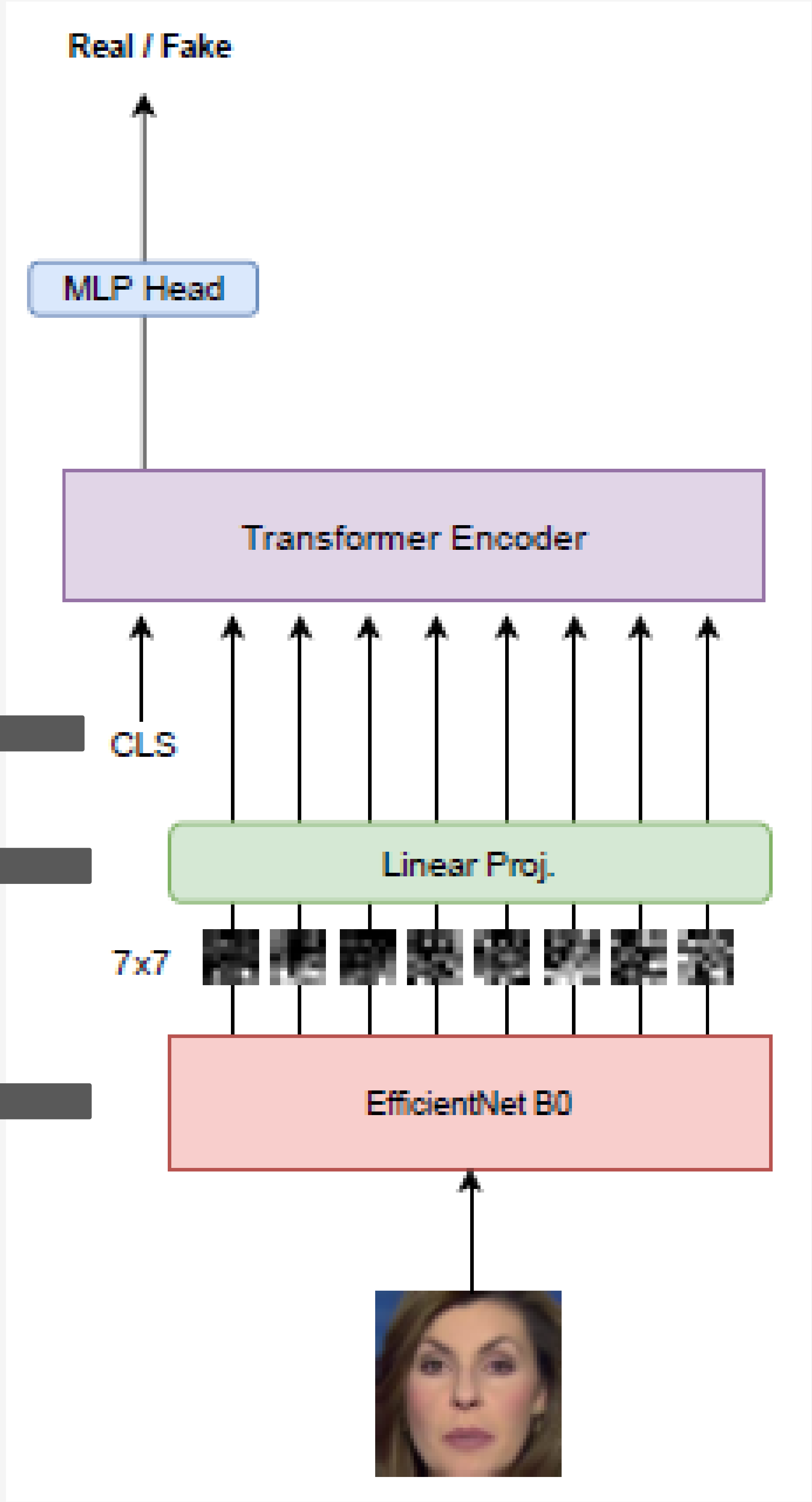
Efficient ViT architecture

결과

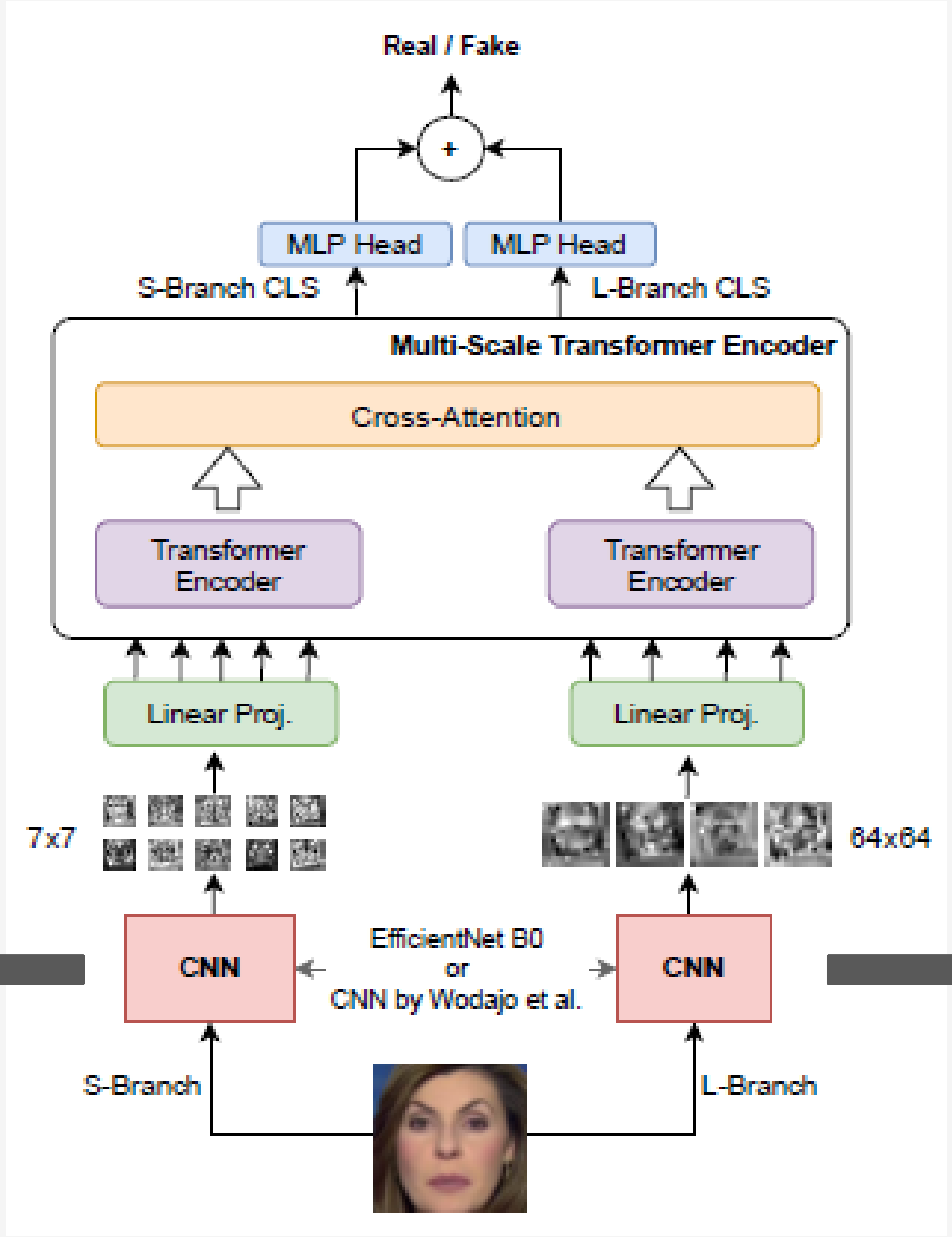
이진 분류 스코어 생성

선형 투영

특징 추출



Convolutional Cross ViT architecture



Small patch
-> local view

Large patch
-> global view

Results

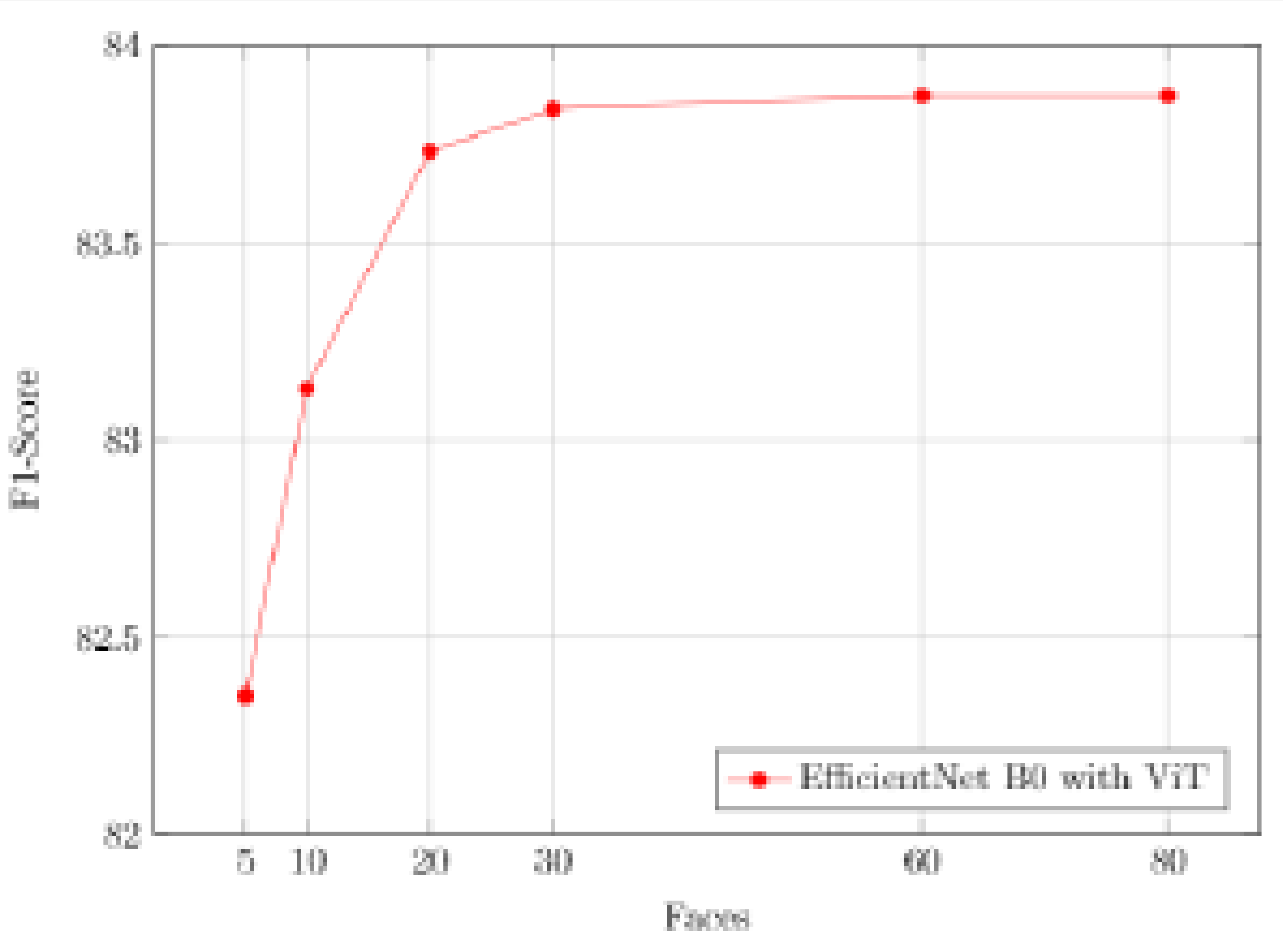
Table 1: Results on DFDC test dataset

Model	AUC	F1-score
ViT with distillation [Heo et al., 2021]	0.978	91.9%
Selim EfficientNet B7 [Seferbekov, 2020]	0.972	90.6%
Convolutional ViT	0.843	77.0%
Efficient ViT (our)	0.919	83.8%
Convolutional Cross ViT (our)	0.925	84.5%
Efficient Cross ViT (our)	0.951	88.0%

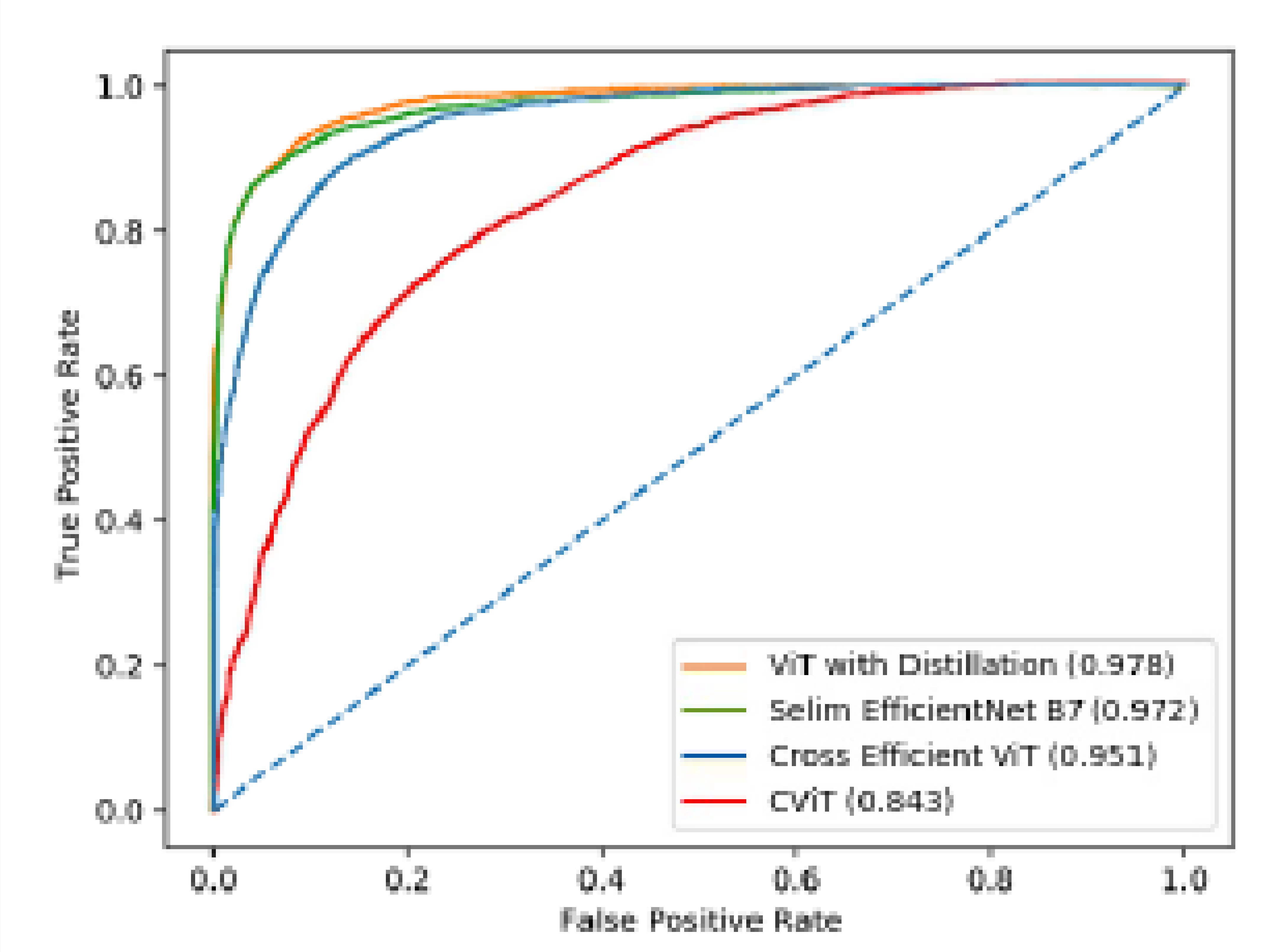
Table 2: Models accuracy on FaceForensics++

Model	Mean	FaceSwap	DeepFakes	FaceShifter	NeuralTextures
Convolutional ViT [Wodajo and Atnafu, 2021]	67%	69%	**93%**	46%	60%
Efficient ViT (our)	76%	78%	83%	76%	68%
Convolutional Cross ViT (our)	76%	81%	83%	73%	67%
Efficient Cross ViT (our)	**80%**	**84%**	87%	**80%**	**69%**

F1-score versus the number of extracted faces



ROC Curves comparison



감사합니다