

AI-GENERATED VS REAL IMAGES

PRESENTED BY: GROUP 2

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OUTLINE



- Problem Definition
- Dataset Introduction
- CNN
- ViT
- Results
- Insights
- Challenges

PROBLEM DEFINITION

Problem

- Misunderstandings in the digital landscape, pose a considerable challenge to the integrity of information distribution

Goal

- Determine the origin of the images we encounter, discerning whether they have been generated by artificial intelligence or not



DATASET INTRODUCTION

AI-GENERATED
50,000 images



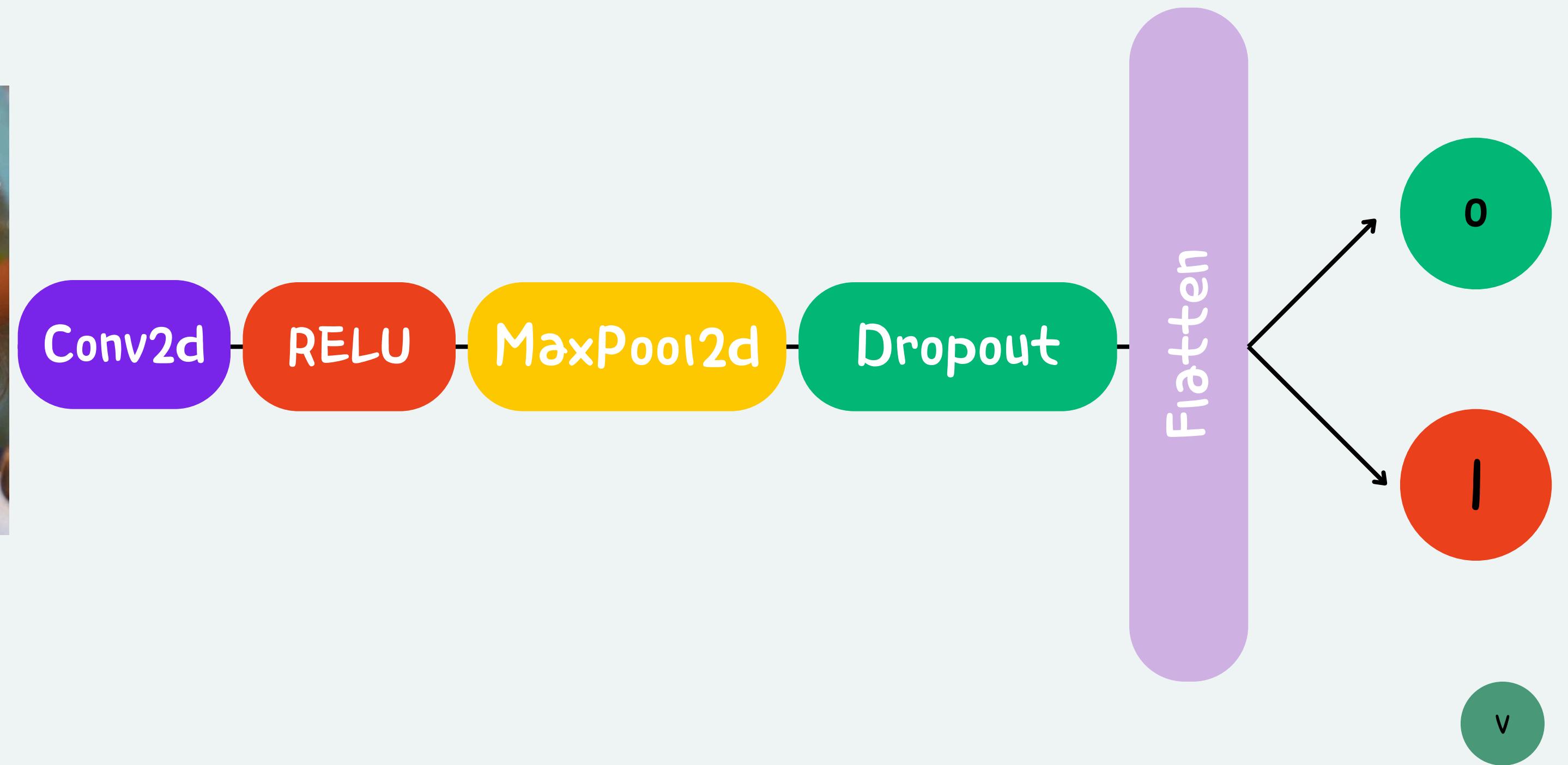
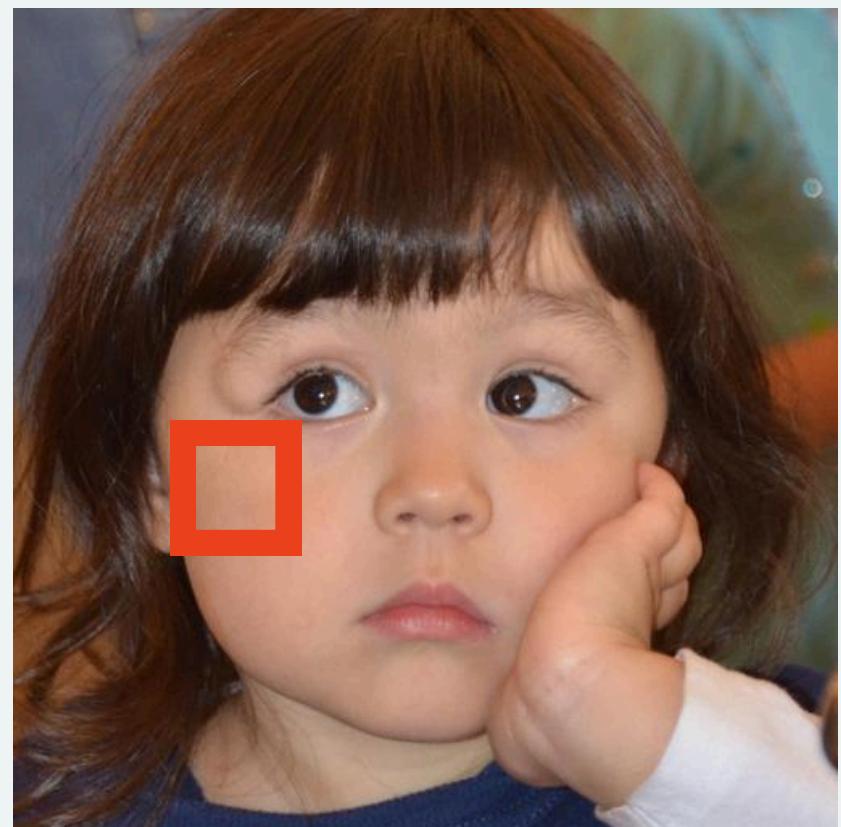
AUTHENTIC
70,000 images



- wide range of facial images
- dataset contains train, validation, and test folders



WHAT IS CNN?



TRAIN ACCURACY



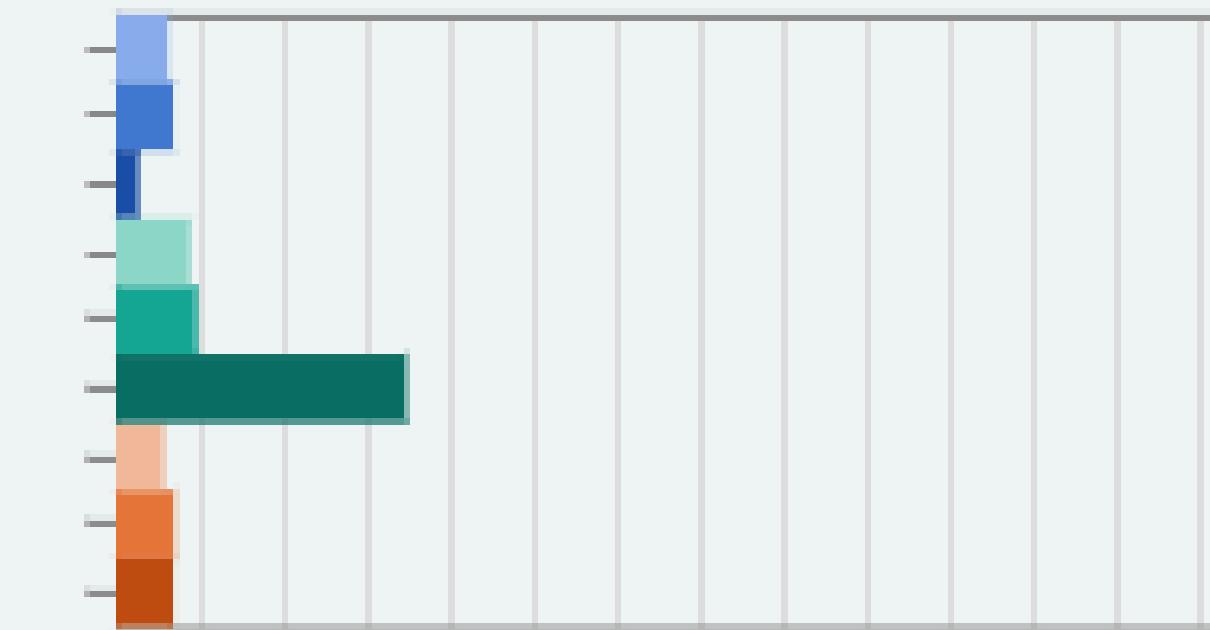
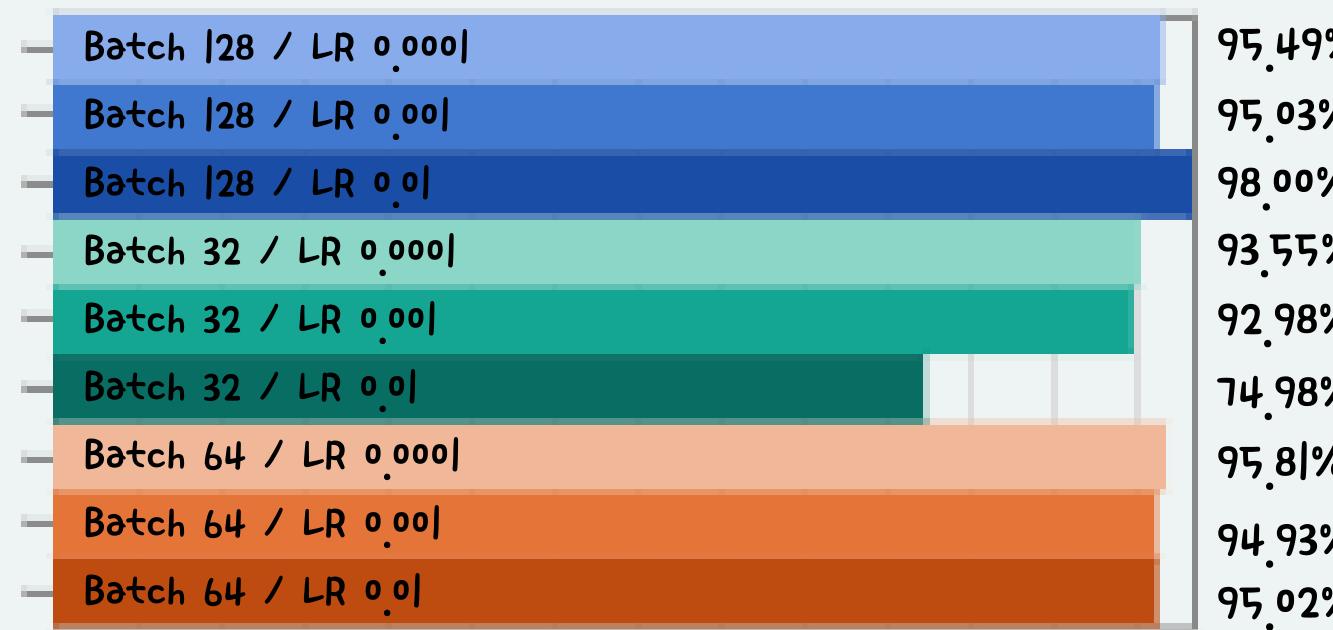
PREDICTED

REAL

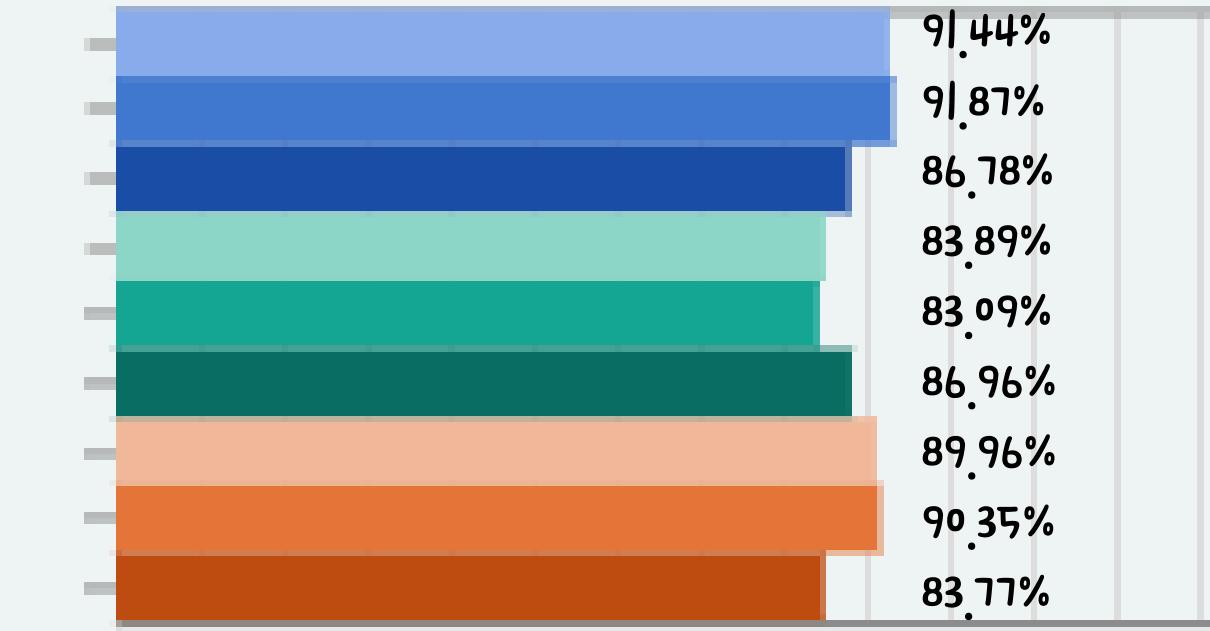
AI-GENERATED

ACTUAL

REAL

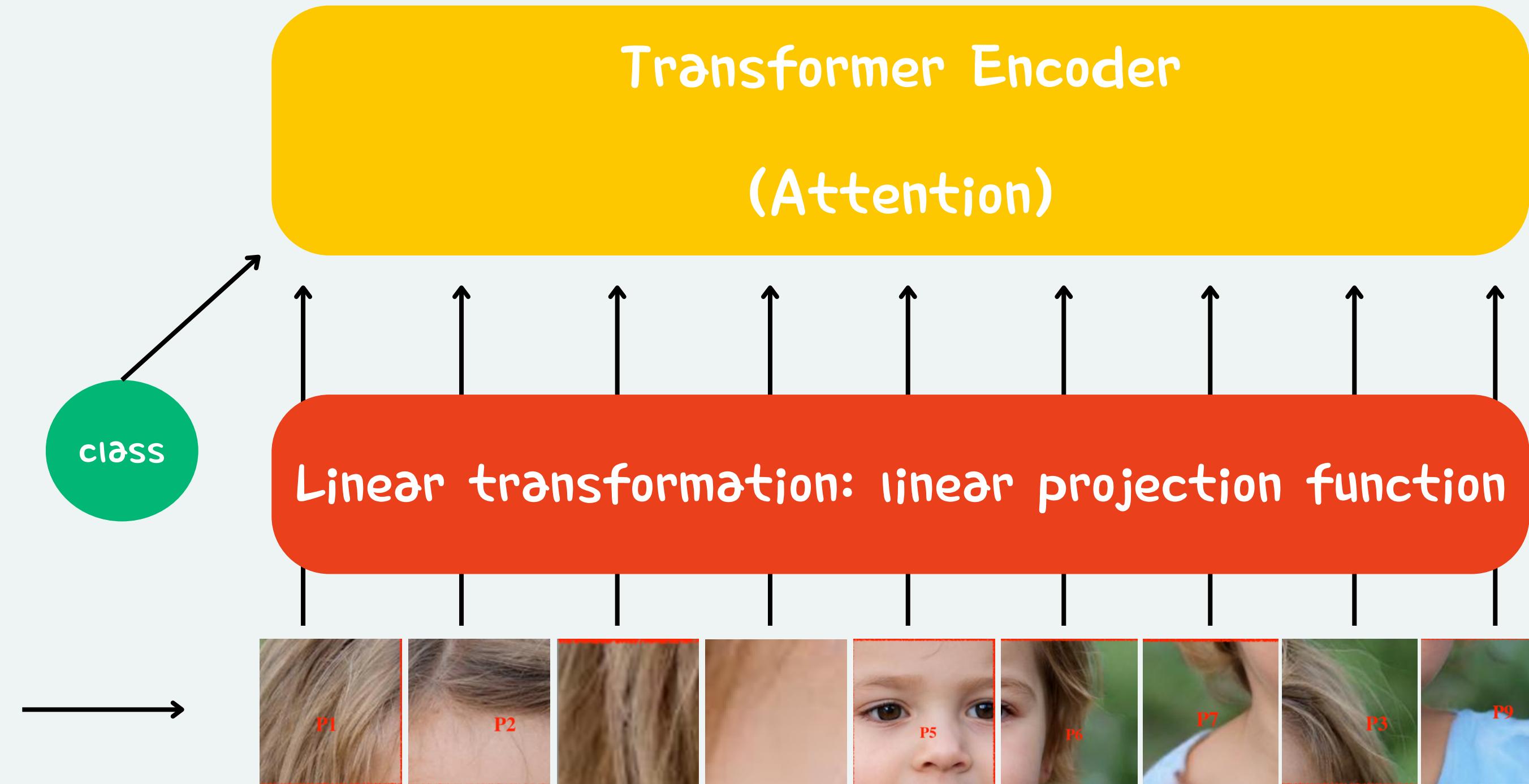
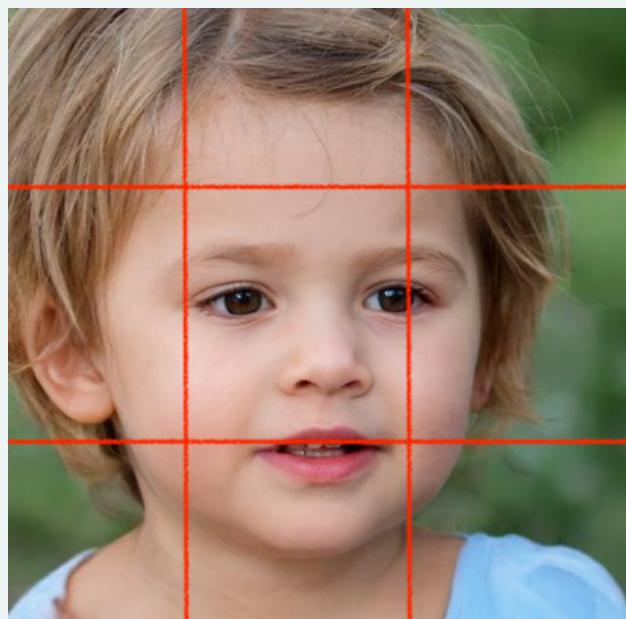
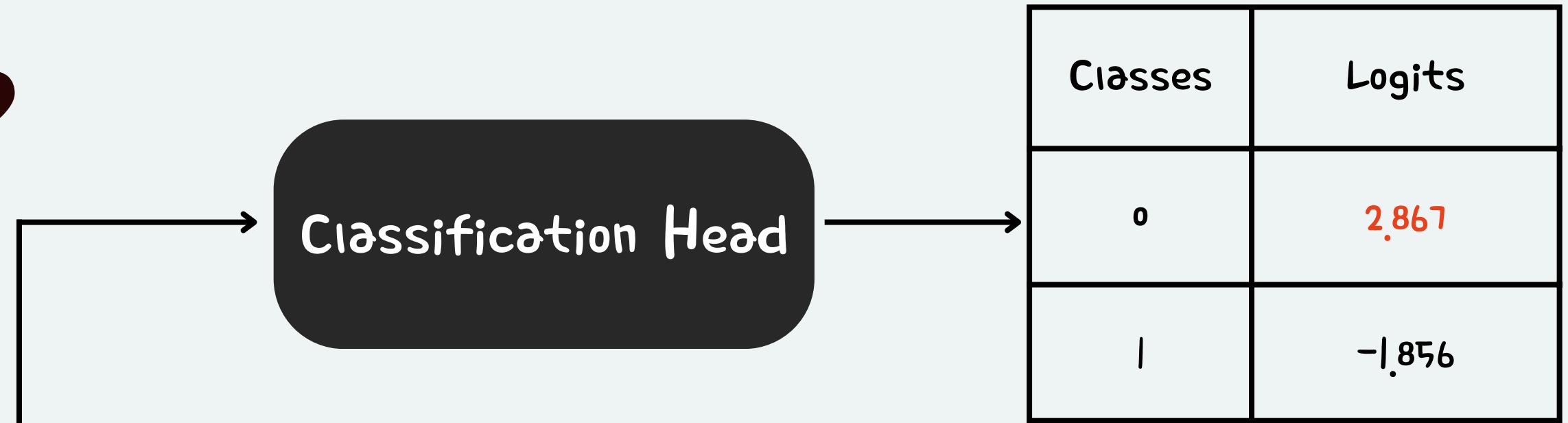


AI-GENERATED



number of accurately predicted real images (AI-generated) / number of actual real images (AI-generated)

WHAT IS ViT?



TRAIN ACCURACY

batch = 32 / lr = 0.01



94.33%

batch = 32 / lr = 0.001

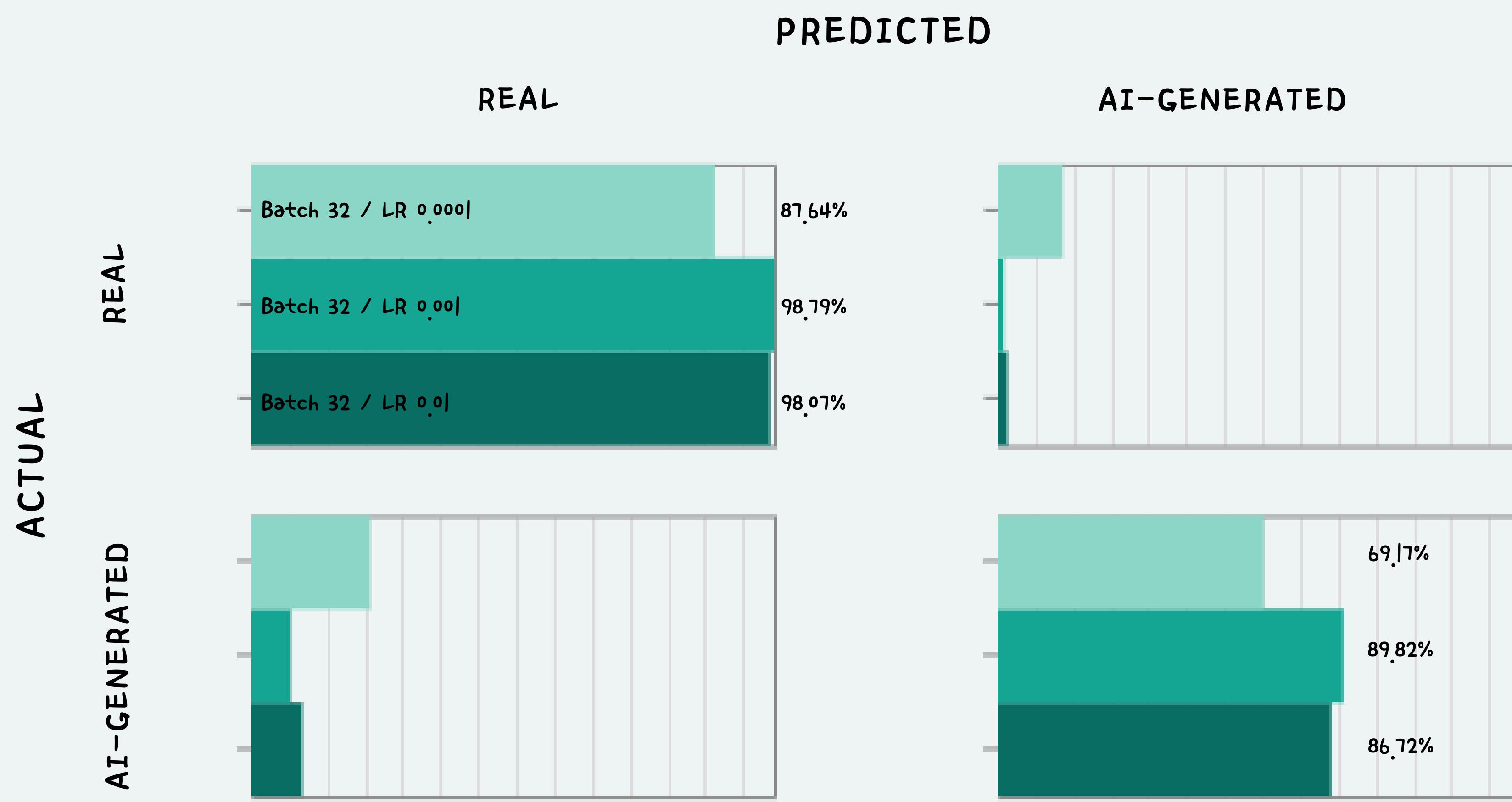


96.11%

batch = 32 / lr = 0.0001



80.31%

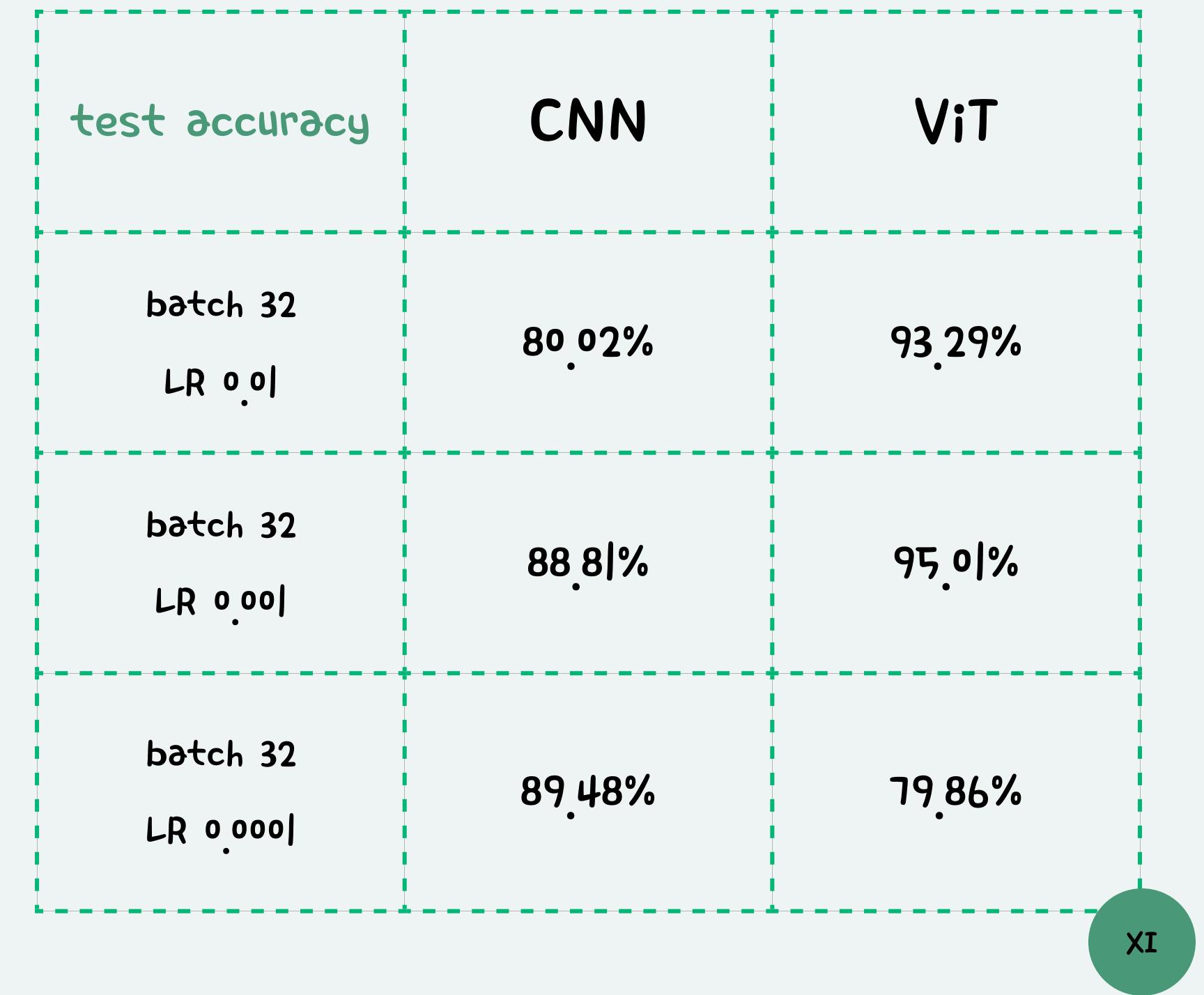


number of accurately predicted real images (AI-generated) / number of actual real images (AI-generated)

x

RESULTS

parameter	CNN	ViT
	948,301	85,800,194



ACTUAL

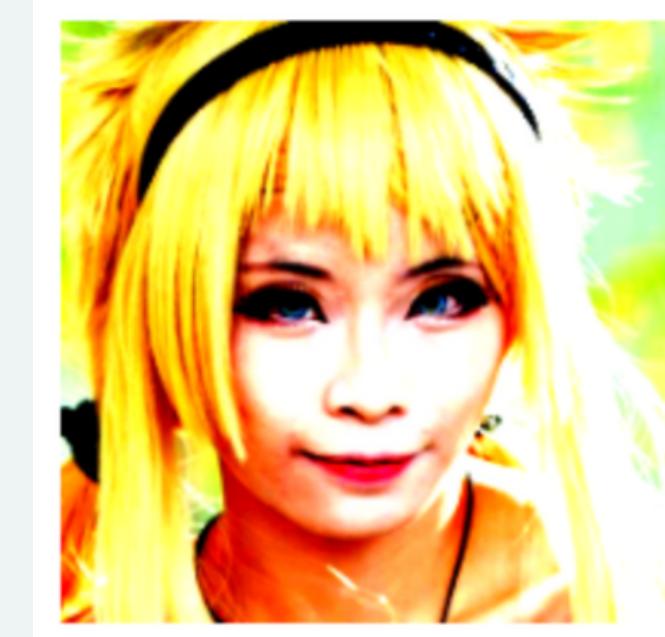
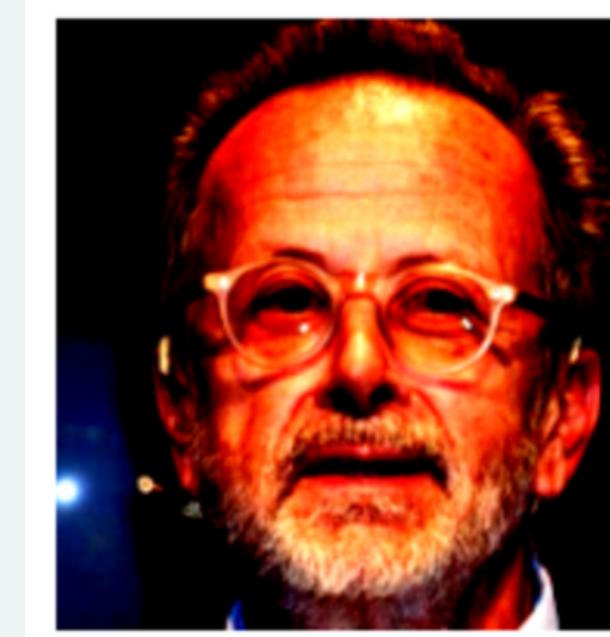
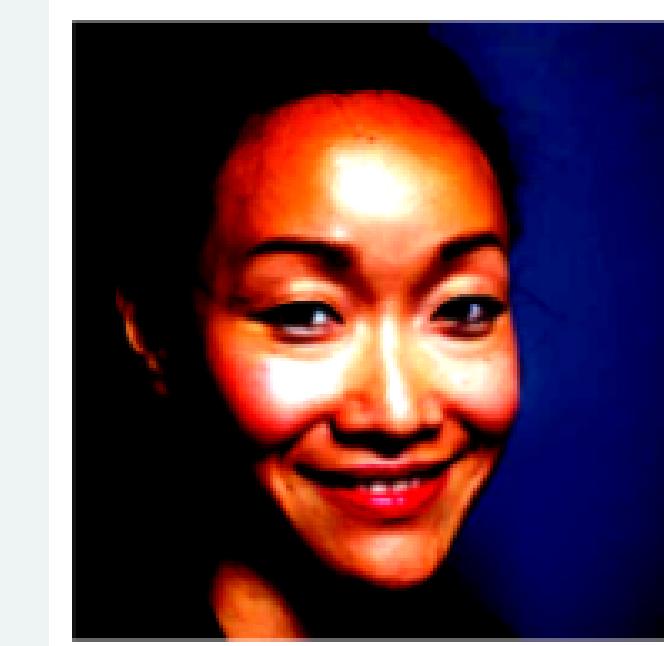
AI-GENERATED

REAL

REAL

PREDICTED

AI-GENERATED



INSIGHTS

PURPOSE RECOMMEND

- CNN – local-to-global feature extraction
- ViT – global features because it can learn attention from each patch

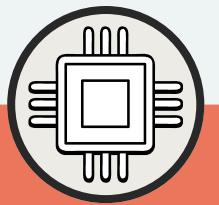
MODEL RECOMMEND

- If the dataset you have is not too complex, it's more suitable to use CNN, because using an advanced model like ViT might cause overfitting

BUSINESS RECOMMEND

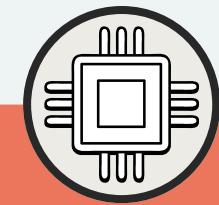
- Help identify misinformation online
- Promote trust in digital content

CHALLENGES



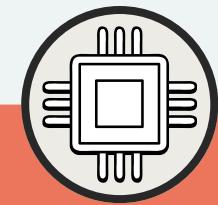
VIT

- Unable to process batches larger than 32



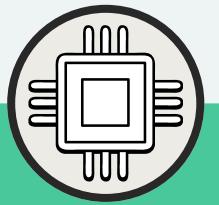
LARGE DATASET

- RAM crash
- cuda out of memory



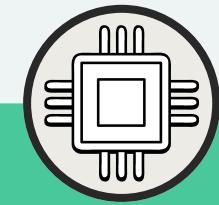
RUN OUT OF TIME

- CNN
- ViT



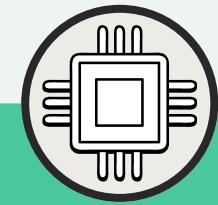
TUNE LR

- lr = 0.01
- lr = 0.001
- lr = 0.0001



LARGE DATASET

- Use SCC
- Upgrade Google Colab



RUN OUT OF TIME

- VGG
(Visual Geometry Group)
- Inception

thank



you

Our model excels with high accuracy across both training and testing phases