

# **Full timeline of individual project, divided by weeks**



Presentation by Mukhtar Rabayev

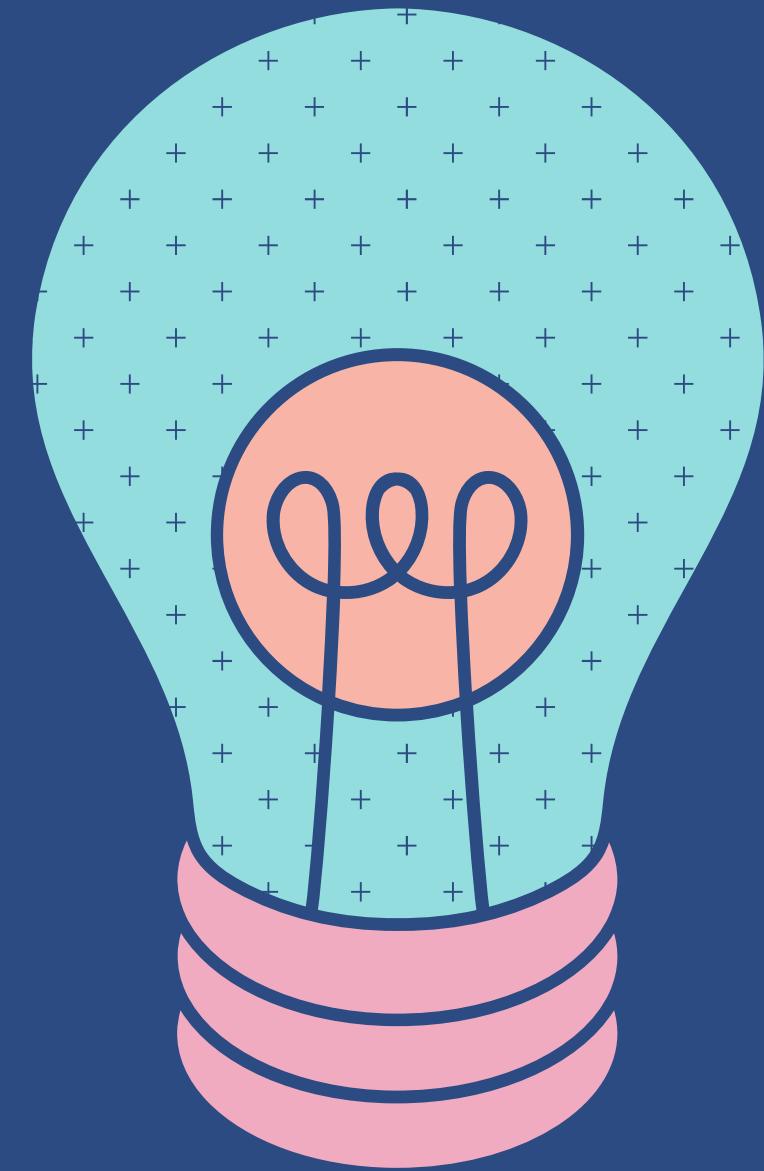
Hof University of Applied Sciences



# Individual Project Description, 1st week

Mukhtar Rabayev

# Preface

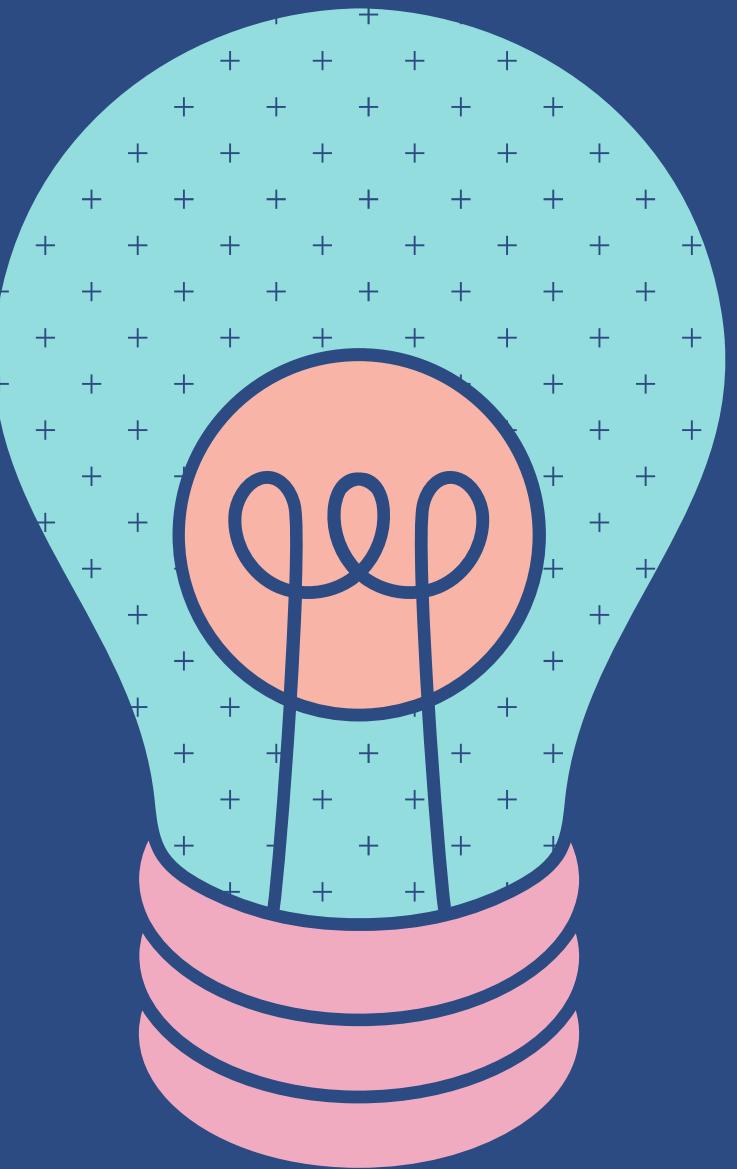


# Drowsiness Detection

- ~ Awake
- ~ Drowsy

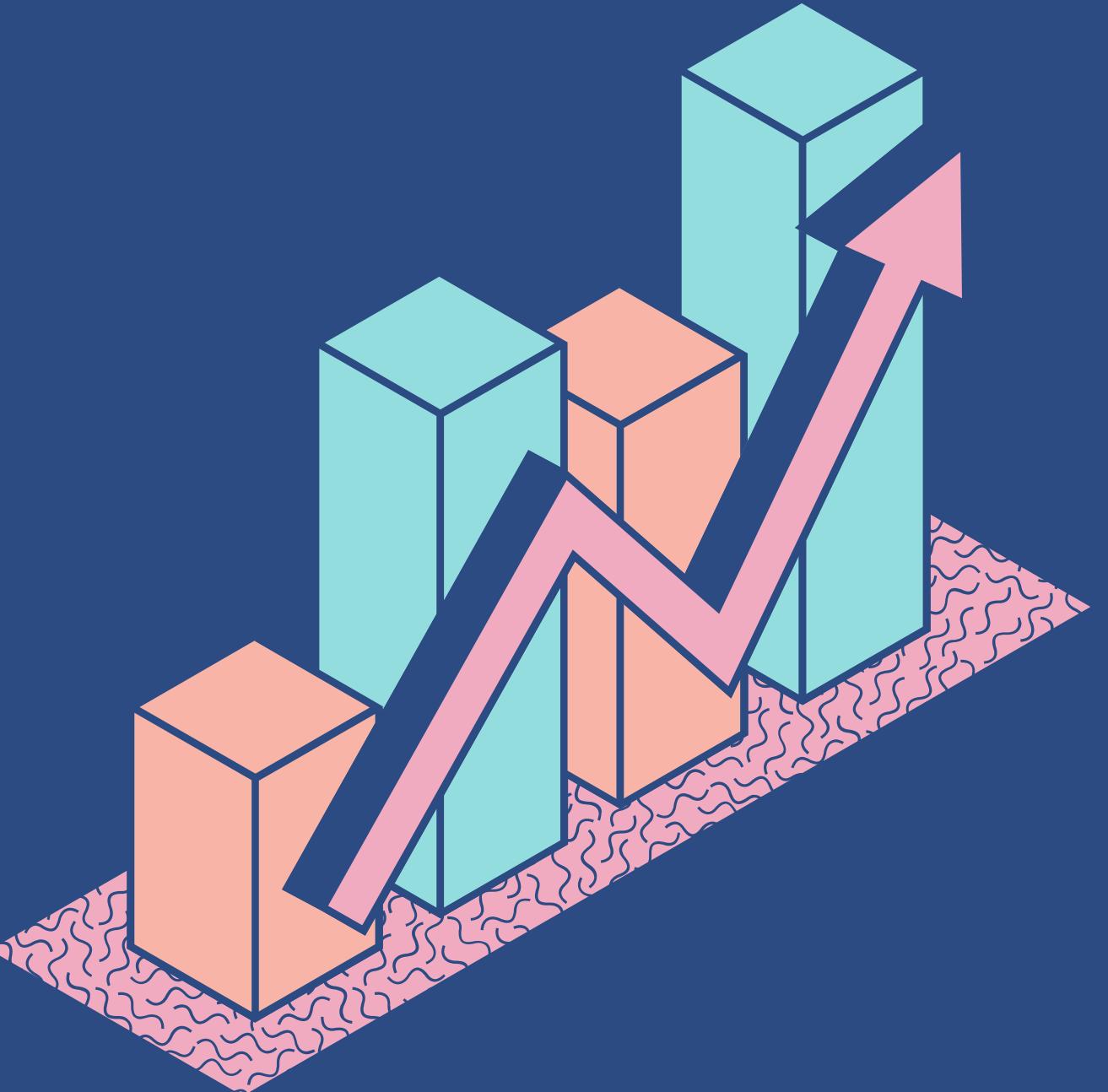


# Why we could need this?



# With what I will be acquainted with?

- ~ YOLO, PYTORCH
- ~ INSERTING MY OWN IMAGES
- ~ LEARNING TO LABEL IMAGES WITH LABELIMG
- ~ TRAINING MODEL WITH MY OWN DATA



# Playing cards detection

- ~ More classes
- ~ More labels



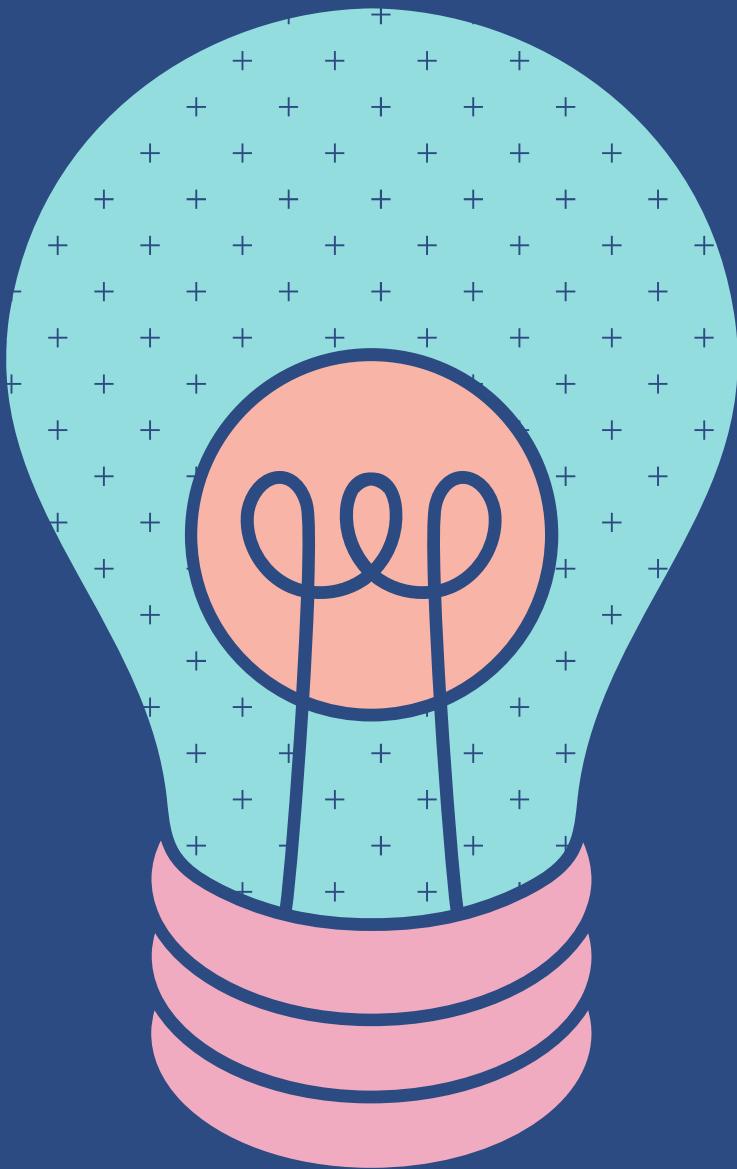
A background collage of various school supplies on a dark blue surface. It includes a pink pencil case with a black zipper, a pink eraser, a teal highlighter, a pink and white patterned notebook, a small teal smartphone, and a pink and white patterned pencil. A large white speech bubble is positioned at the top right.

# More detailed information about the individual project, 2nd week

Mukhtar Rabayev

The main question:

**WHAT CARDS TO DETECT?**





## UNO CARDS:

### 6 LABELS:

- NUMBERED CARDS
- SKIP CARDS
- REVERSE CARDS
- DRAW 2 CARDS
- WILD CARD: COLOR
- WILD CARD: DRAW 4 CARDS

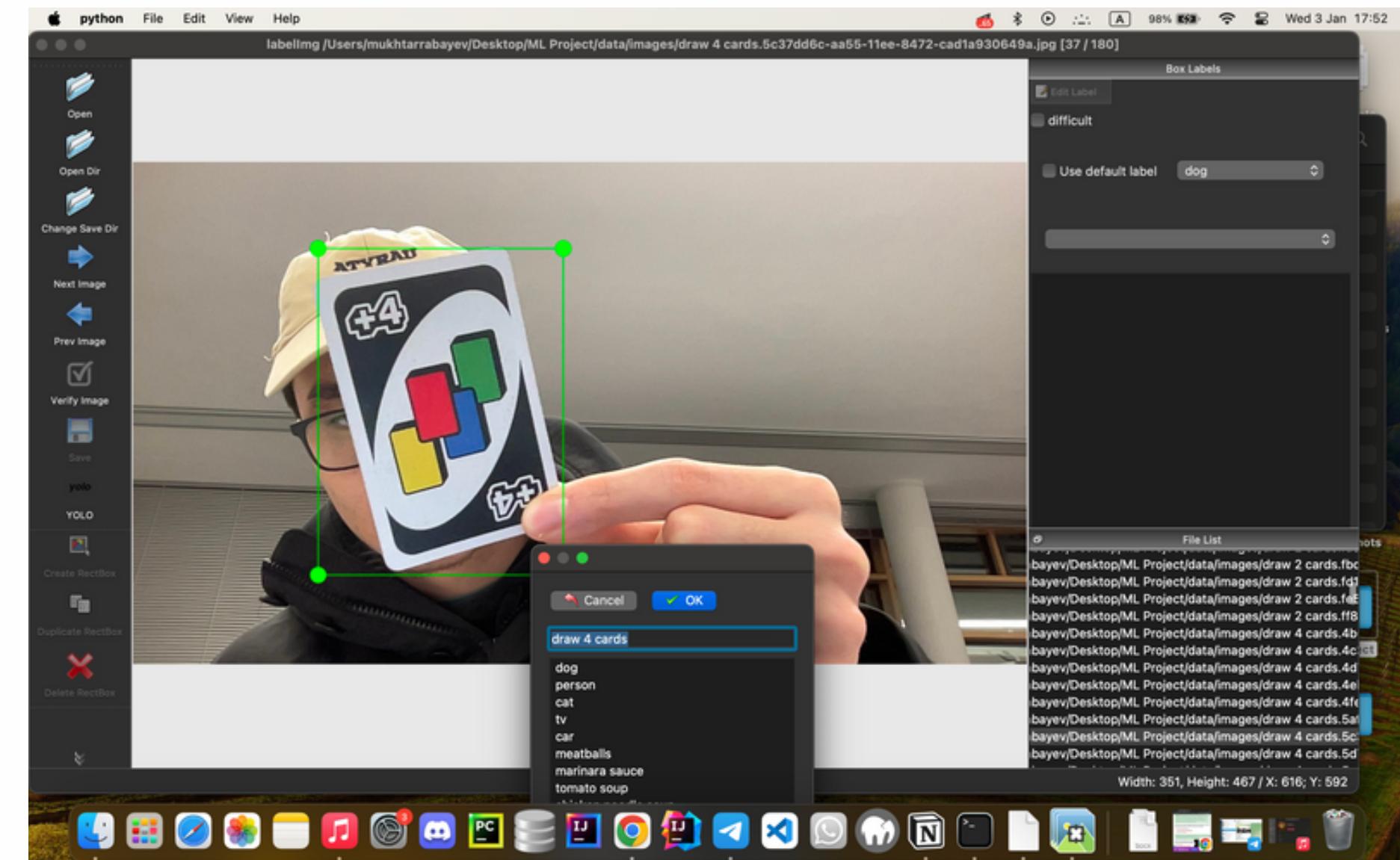
# The way to give own dataset to model

- Using OpenCV
- Collecting images and  
immediately saving to Images file



# How to label saved images?

- Downloading LabelImg to machine
- Dealing with a plenty of errors while downloading
- Labeling with yolo format
- Saving labeled images to another file



# Training process

1 ————— 2 ————— 3 ————— 4 ————— 5

## STEP

Cloning yolov5  
repository,  
installing  
required  
dependencies,  
including pytorch

## STEP

Preparing  
dataset

## STEP

Running the  
training  
command  
(waiting a looot  
of time)

## STEP

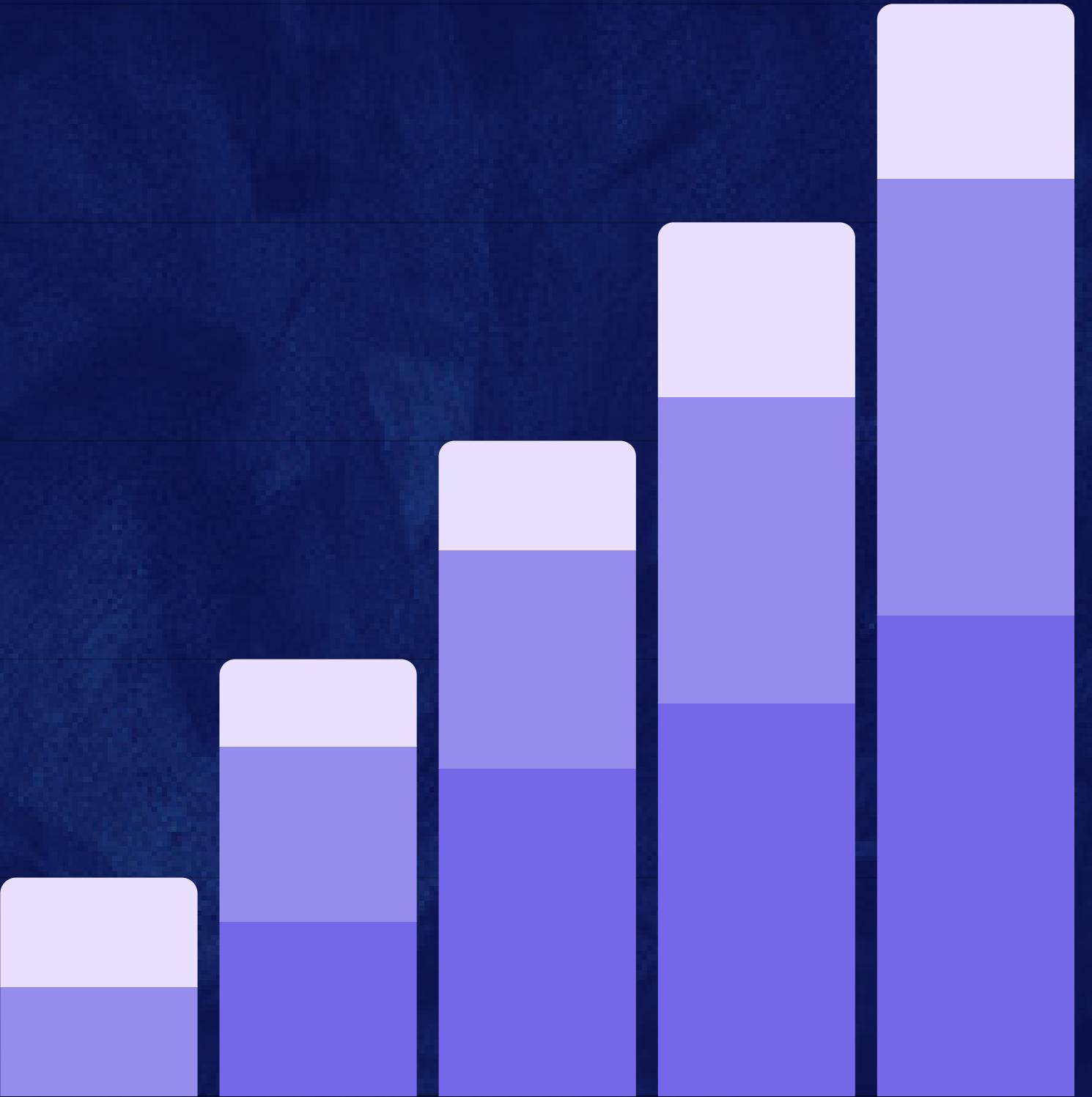
Attaching last  
result to model

## STEP

Testing the model

# Individual project progress 3rd week

Mukhtar Rabayev



# What changed?

- The number of labels: 6 -> 15
- Dataset labeling environment:  
labelImg -> roboflow
- The size of dataset 180 -> 980
- yolo version v5 -> v8

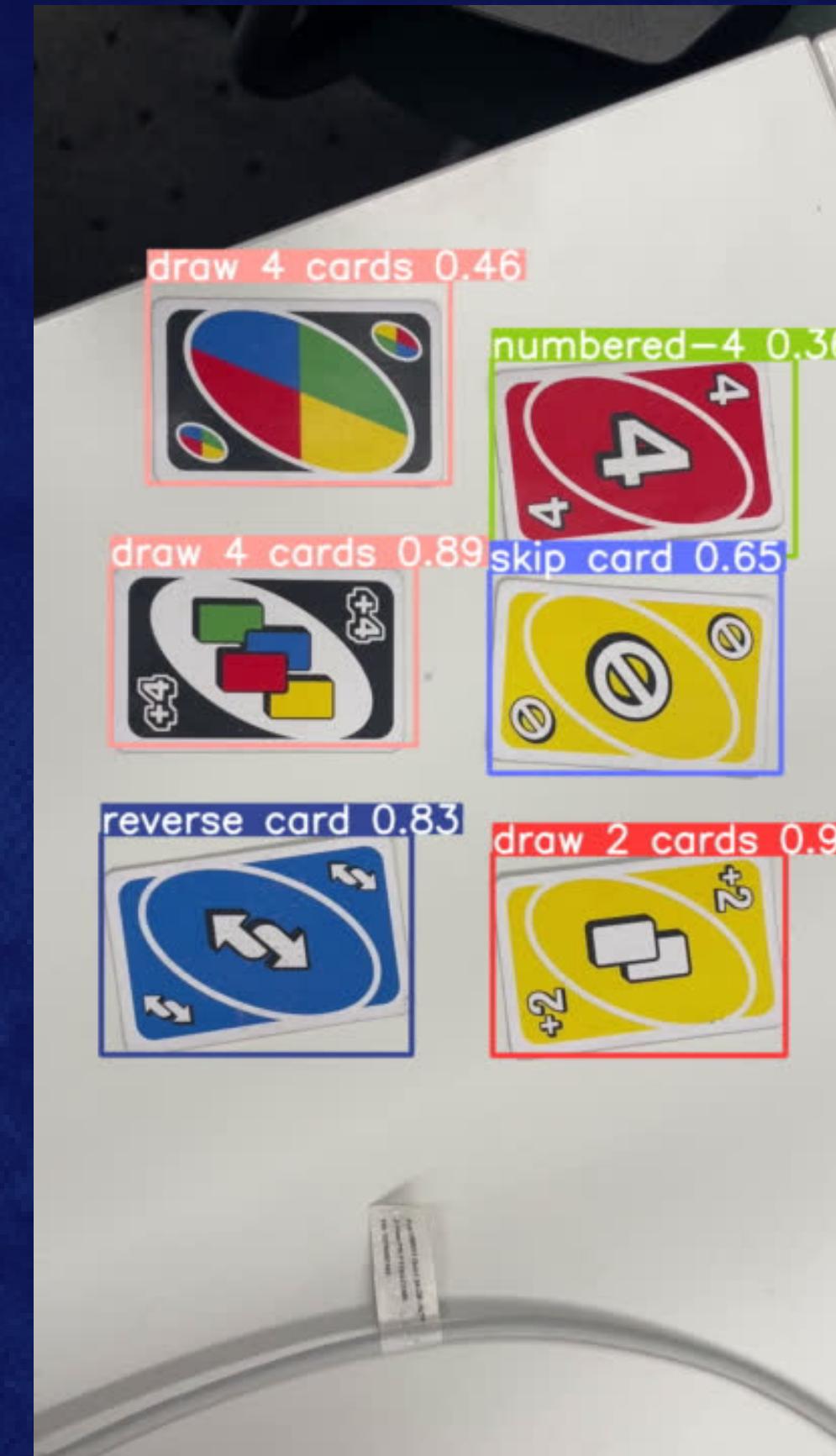
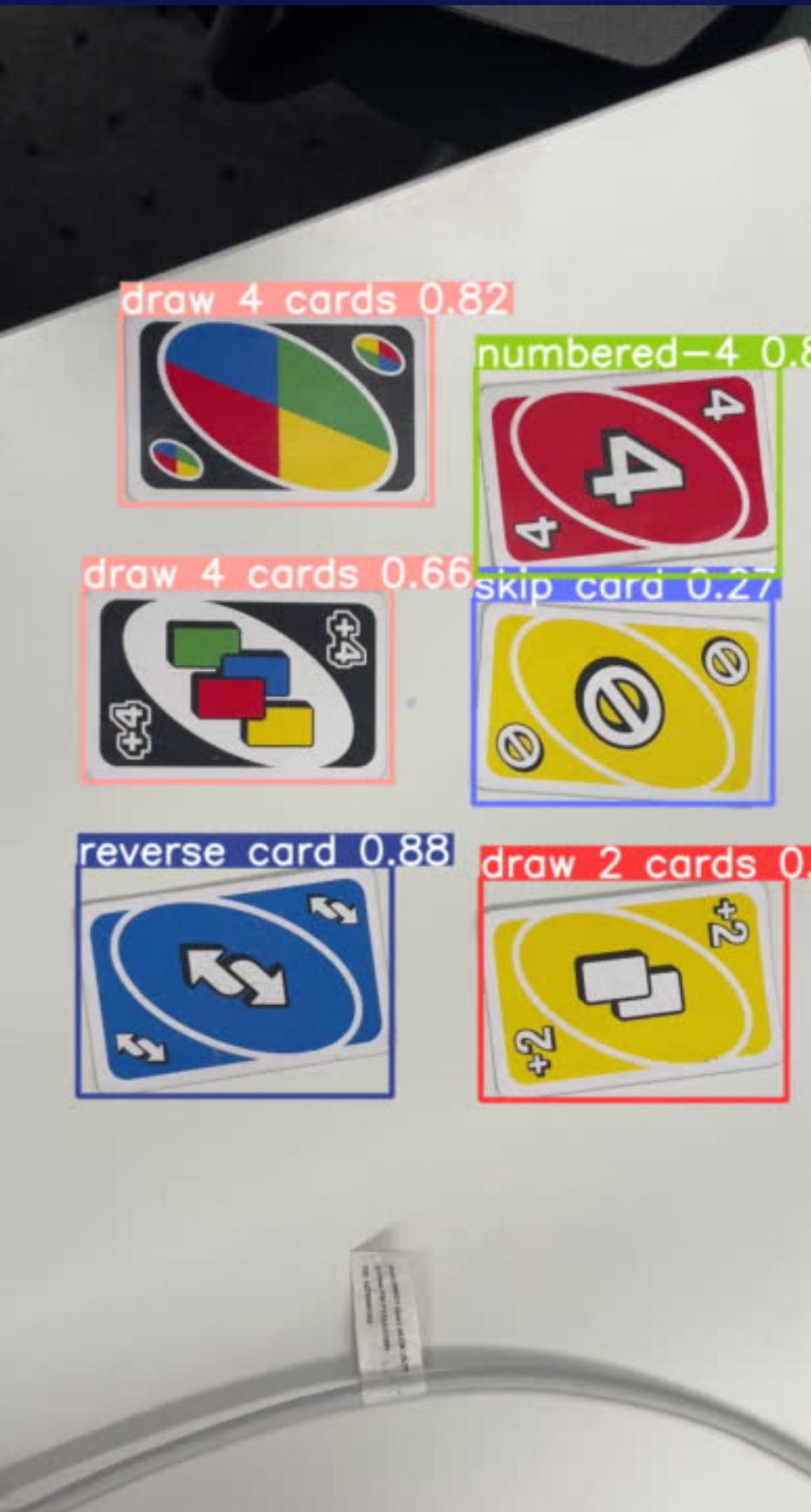


# What is done?

- Captured photos with opencv as in previous week
- Labeled all images with roboflow
- Cropped images to size=640 having labeled image inside
- Added 49+ photos to every class
- Added data augmentation
- Model is trained sequentially, having overall of 155 epochs



# The progress of the model



# The progress of the model

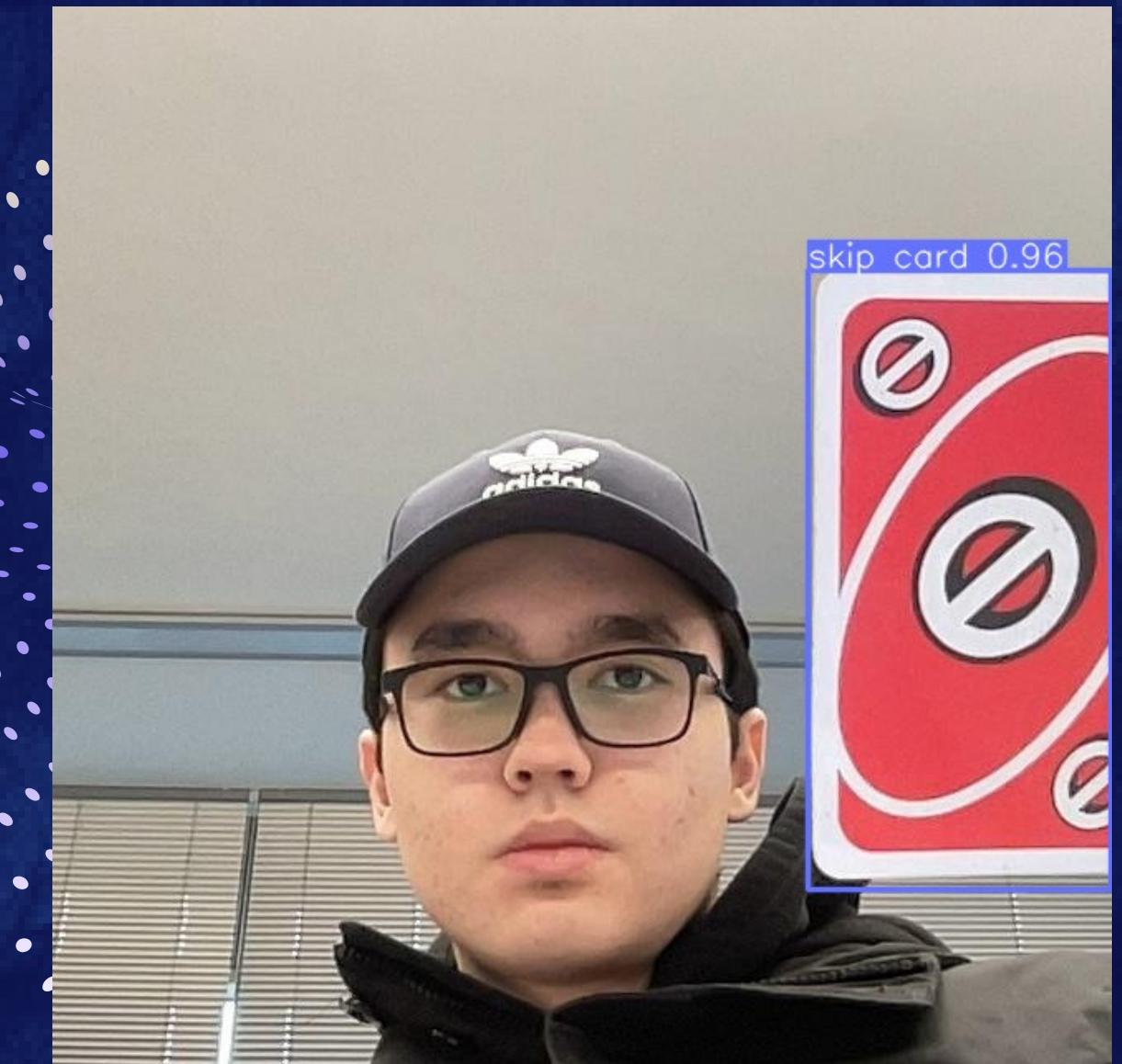
180 photos



406 photos

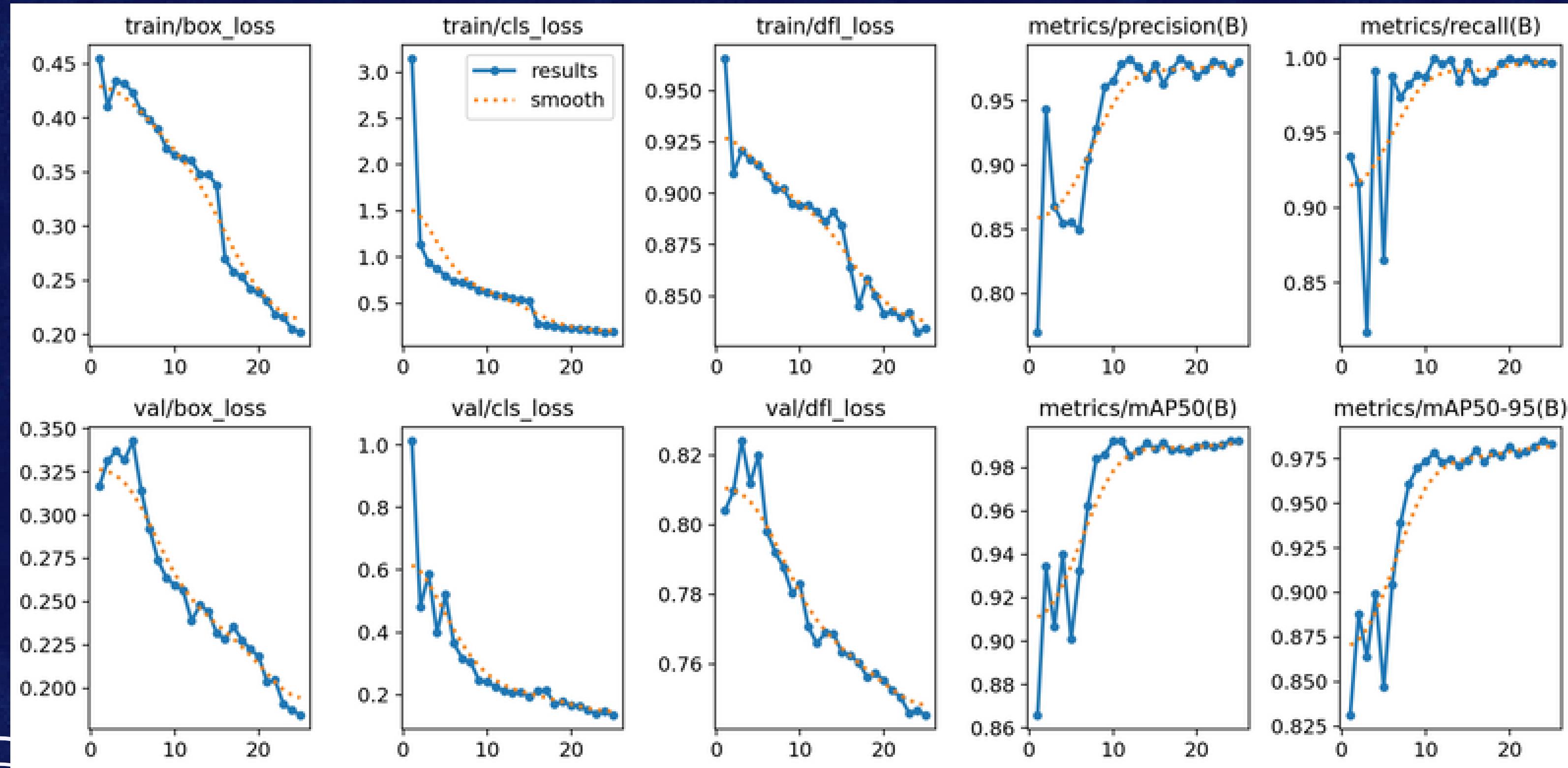


980 photos



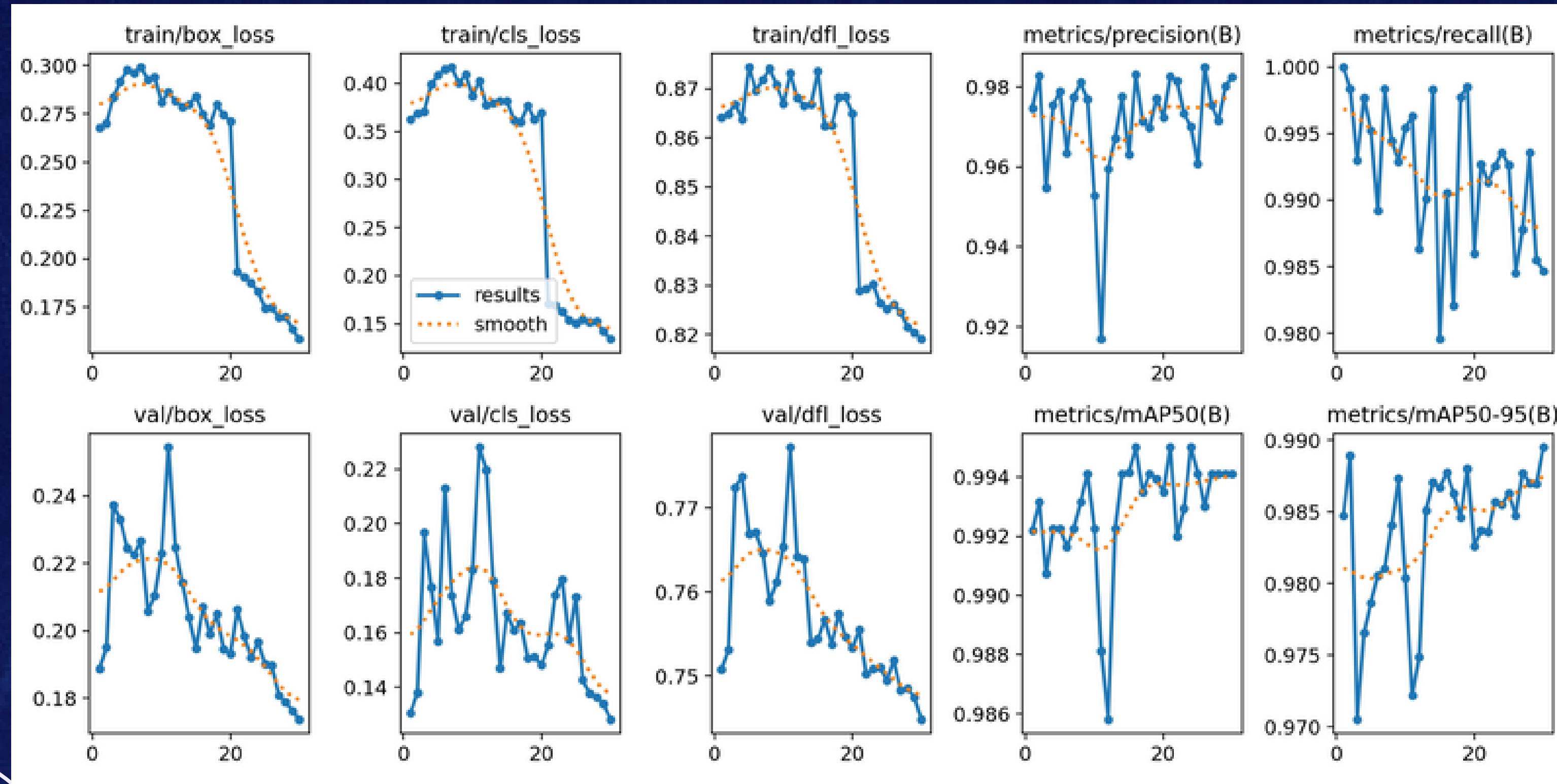
3 days of adding photos to dataset

# The progress of the model



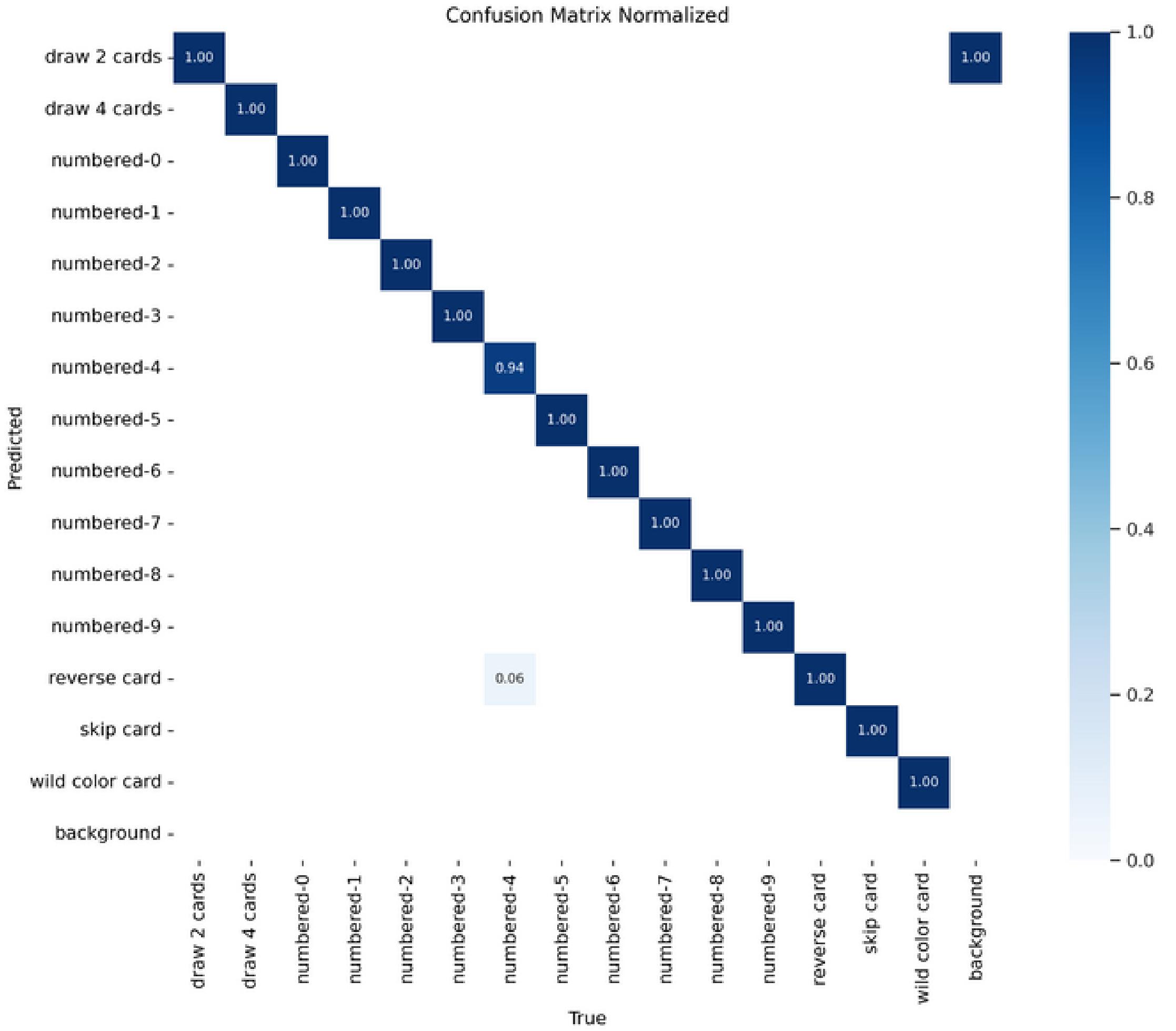
train 1

# The progress of the model



train 5

# Confusion matrix



# How others can use the model?

## Install ultralytics to your environment

```
Ввод [1]: !pip install ultralytics==8.0.196
Requirement already satisfied: ultralyt
(8.0.196)
```

Download photo from the internet  
or capture by yourself, f.e. ->



**Write this code, specify model's path,  
and your photo's path as a source**

```
import ultralytics  
  
from ultralytics import YOLO  
  
!yolo task=detect mode=predict model=.. conf=0.25 source=..
```

**Results will be saved in directory**

```
Specifying YOLOv8n-predictor, 20 items detected.  
Results saved to runs/detect/predict  
💡 Learn more at https://docs.ultralytics.com
```

**Display the results**

```
from IPython.display import Image  
  
image_path = "/Users/mukhtarrabayev/Desktop/runs/detect/predict/plcards.jpeg"  
  
Image(filename=image_path, width=600)
```

# Output:



The background features a dark blue gradient with three glowing, translucent 3D torus shapes. One large ring is positioned vertically on the left side, while two smaller rings are located on the right side, one above the other.

# Last corrections and submitting the project

Mukhtar Rabayev



# What is done?

After the training of model, decided to  
create simple GUI



**After a plenty of errors,  
acknowledged with  
PySimpleGUI**

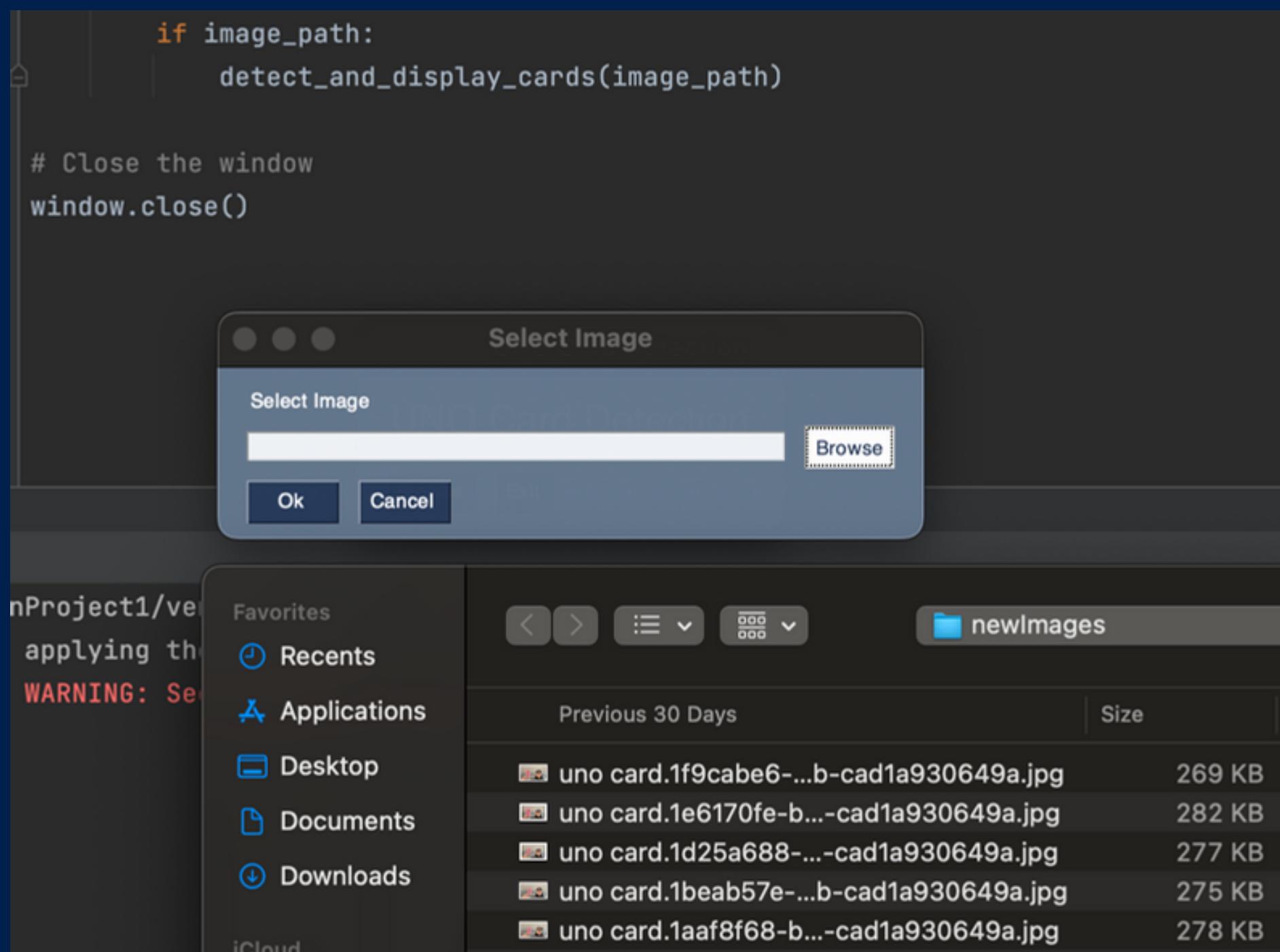


**PySimpleGUI**

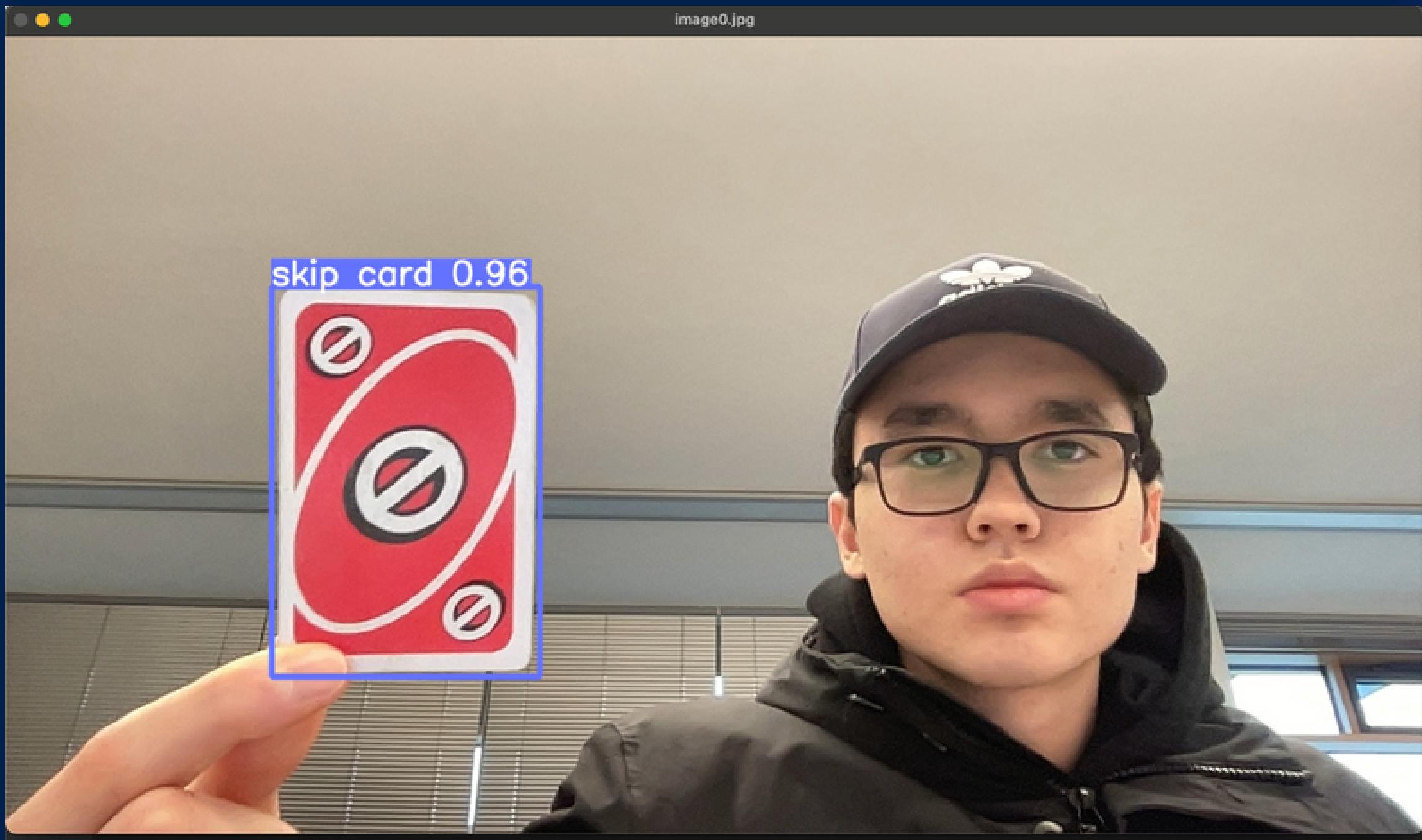
# How it looks?

```
if image_path:  
    detect_and_display_cards(image_path)  
  
# Close the window  
window.close()  
  
  
nProject1/venv/bin/python /Users/mukhtarrabayev/PycharmProjects/python  
applying the patch  
WARNING: Secure coding is not enabled for restorable state! Enable se
```

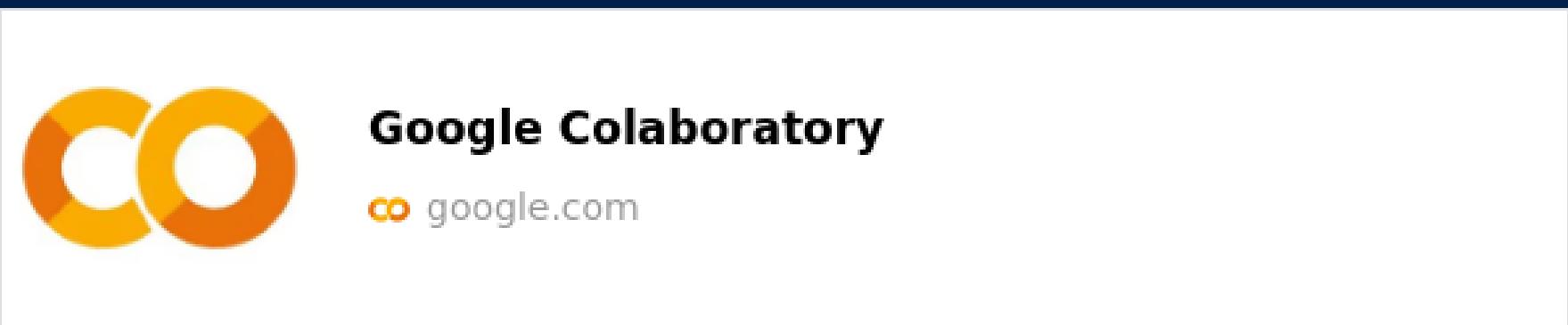
# Selecting the image



# Result



# How it was trained?



[https://colab.research.google.com/drive/1dL2acAvYxYacoORqAXziWwzTcKwpYMd8?usp=drive\\_link](https://colab.research.google.com/drive/1dL2acAvYxYacoORqAXziWwzTcKwpYMd8?usp=drive_link)



Thank You  
for your  
attention