Failed solution

Step 1: Collecting the data

For this assignment we were asked to collect data for training an object detection model. One of the requirements for the dataset - at least 2 different classes and at least 100 instances on all the pictures.

Initially I decided to classify different types of drinks that you can by in store like Pyaterochka and Magnit. However I met a few problems:

1. Some packs of drinks (either bottles or paperboard boxes) are not clearly visible because they stand after others
2. Front packs have parts of others too close to them, so it’s not the clear representation of an actual beverage packaging
3. Different drink types have the same packaging design

Pictures representing the problem:

1 and 2 points

Canned wine that looks like soda

While the first 2 problems can be resolved by making closer and straight pictures of the drinks the 3rd can be solved only by removing such examples from the dataset or hoping that the model will be able to deal with this issue.

Step 2: Annotating the data

At this step I annotated ~20 images with 3 types of drinks: soda, juice and bottled water.

The 2nd problem can be resolved on this step by choosing an appropriate tool, but in return it takes more time to annotate each package.

An example of a part of annotated image

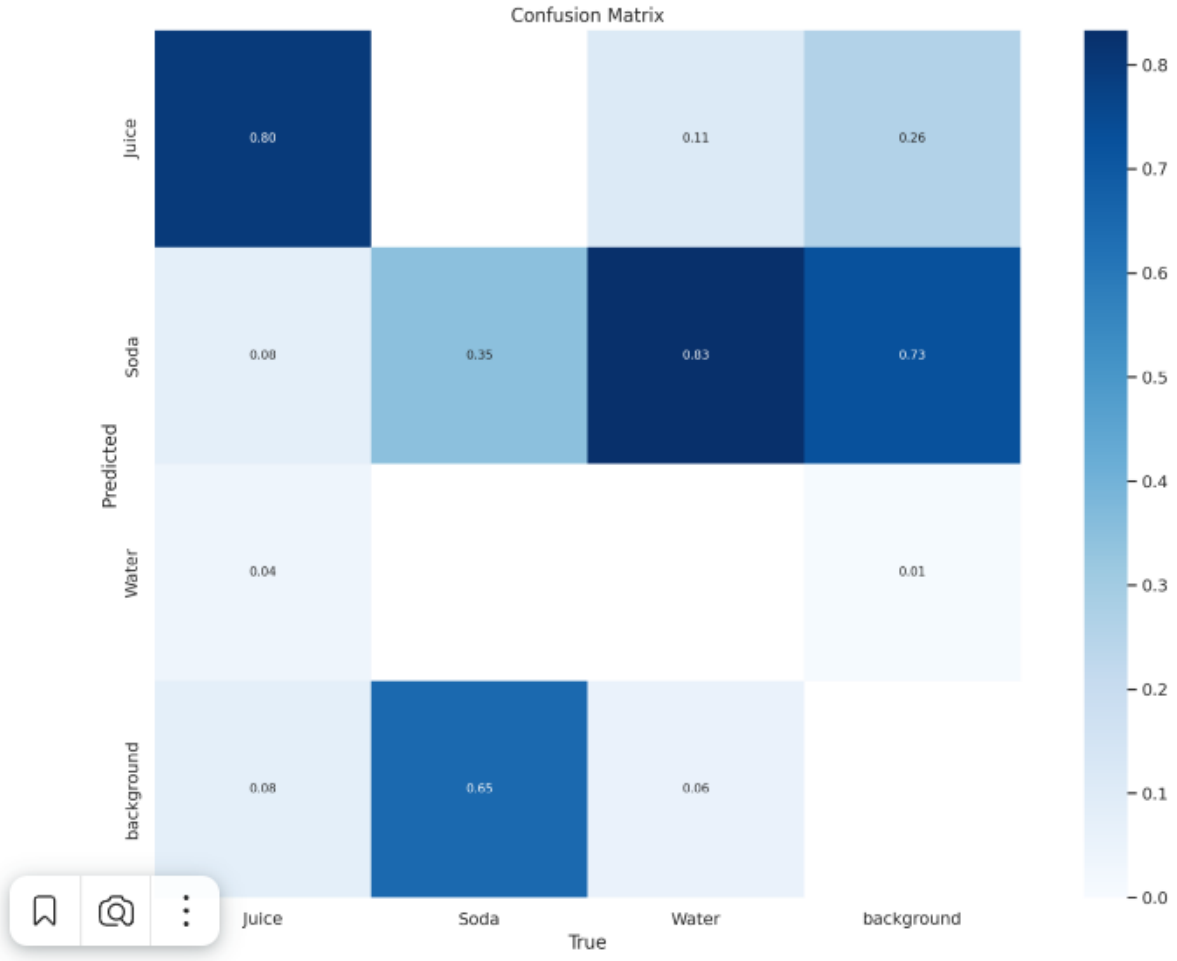
As you can see another problem that I met - images are compressed when uploaded to roboflow, so it’s better to use initially small photos if you want a better resolution while annotating. The images in the final dataset of the normal resolution (if no options of augumentation and reshaping are made)

Step 4: Training Yolov8

I decided to check this dataset by training Yolov8 model, but the results were unsatisfactory, so I had either to think on what to change there or just start collecting data for a new dataset.

Here is the confusion matrix for the model.

While it’s good in predicting Juice It confuses soda as water and completely cannot identify bottled water.


Confusion Matrix
Juice
Soda
Water
background
Predicted
0.80
0.11
0.26
0.08
0.35
0.83
0.73
0.04
0.01
0.08
0.65
0.06
Juice
Soda
Water
background
True
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0