

Model Development Phase Template

Date	15 March 2024
Team ID	740050
Project Title	YOLOChemDetect safeguarding with Automated Drug Name Detection
Maximum Marks	10 Marks

Initial Model Training Code, Model Validation and Evaluation Report

The initial model training code will be showcased in the future through a screenshot. The model validation and evaluation report will include a summary and training and validation performance metrics for multiple models, presented through respective screenshots.

Initial Model Training Code (5 marks):



```

Drug_Detection.ipynb
File Edit View Insert Runtime Tools Help Changes will not be saved

+ Code + Text Copy to Drive

!pip install -q kaggle

[ ] from google.colab import files
files.upload()

[ ] from google.colab import drive
drive.mount('/content/drive')

Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount("/content/drive", force_remount=True).

[ ] import shutil

# Assuming the output is saved in a folder called 'runs'
# Move results to your Google Drive folder
shutil.move('/content/runs', '/content/drive/MyDrive/runs')

[ ] mkdir ~/.kaggle

mkdir: cannot create directory '/root/.kaggle': File exists

[ ] cp kaggle.json ~/.kaggle
  
```

```
[ ] lcp kaggle.json ~/.kaggle

[ ] !kaggle datasets download -d pkdarabi/The-Drug-Name-Detection-Dataset

Warning: Your Kaggle API key is readable by other users on this system! To fix this, you can run 'chmod 600 /root/.kaggle/kaggle.json'
Dataset URL: https://www.kaggle.com/datasets/pkdarabi/The-Drug-Name-Detection-Dataset
License(s): Attribution 4.0 International (CC BY 4.0)
The-Drug-Name-Detection-Dataset.zip: Skipping, found more recently modified local copy (use --force to force download)

[ ] Start coding or generate with AI.

[ ] !unzip The-Drug-Name-Detection-Dataset.zip

Archive: The-Drug-Name-Detection-Dataset.zip
replace data.yaml? [y]es, [n]o, [A]ll, [N]one, [r]ename: A
inflating: data.yaml
inflating: test/images/20230812_210244.jpg.rf.a2373a15c967eb6a157295e74fc71f45.jpg
inflating: test/images/20230812_210441.jpg.rf.304261e00a390228fdd99f23079290aa.jpg
inflating: test/images/20230812_213537.jpg.rf.ca0e0d08c6190258312e46cca65d229.jpg
inflating: test/images/20230812_214043.jpg.rf.0df6b253cf09bd47d9ffdf2f8158b5d6.jpg
inflating: test/images/20230812_215836.jpg.rf.c9608220426c128e75c907d143f77f9a.jpg
inflating: test/images/20230812_215916.jpg.rf.73cc868bb2038044a6820f8607aae04e.jpg
inflating: test/images/20230812_220455.jpg.rf.16415c5c975af2d02396f2e1957dd1e6.jpg
inflating: test/images/20230812_220806.jpg.rf.fcd789d33cef3a7206e33007a1326197.jpg
inflating: test/images/20230812_220950.jpg.rf.c777cf6714c8ca0516786538db965e15.jpg
inflating: test/images/20230812_221022.jpg.rf.ff9b48cd047470b76d559fb3ceb3b461.jpg
inflating: test/images/20230812_221206.jpg.rf.691388c7826ba7647185ea05dc8b8906.jpg
inflating: test/images/20230812_221626.jpg.rf.f59a448365cd1d23f8f7513c78824389.jpg
inflating: test/images/20230812_221708.jpg.rf.2f211999f6915c86d98eda9de7a1c5d.jpg
inflating: test/images/20230812_221804.jpg.rf.494390a32eb74ea02a25a318668790a5.jpg
```

```
[ ] lcp kaggle.json ~/.kaggle

[ ] !kaggle datasets download -d pkdarabi/The-Drug-Name-Detection-Dataset

Warning: Your Kaggle API key is readable by other users on this system! To fix this, you can run 'chmod 600 /root/.kaggle/kaggle.json'
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inflating: test/images/20230812_210441.jpg.rf.304261e00a390228fdd99f23079290aa.jpg
inflating: test/images/20230812_213537.jpg.rf.ca0e0d08c6190258312e46cca65d229.jpg
inflating: test/images/20230812_214043.jpg.rf.0df6b253cf09bd47d9ffdf2f8158b5d6.jpg
inflating: test/images/20230812_215836.jpg.rf.c9608220426c128e75c907d143f77f9a.jpg
inflating: test/images/20230812_215916.jpg.rf.73cc868bb2038044a6820f8607aae04e.jpg
inflating: test/images/20230812_220455.jpg.rf.16415c5c975af2d02396f2e1957dd1e6.jpg
inflating: test/images/20230812_220806.jpg.rf.fcd789d33cef3a7206e33007a1326197.jpg
inflating: test/images/20230812_220950.jpg.rf.c777cf6714c8ca0516786538db965e15.jpg
inflating: test/images/20230812_221022.jpg.rf.ff9b48cd047470b76d559fb3ceb3b461.jpg
inflating: test/images/20230812_221206.jpg.rf.691388c7826ba7647185ea05dc8b8906.jpg
inflating: test/images/20230812_221626.jpg.rf.f59a448365cd1d23f8f7513c78824389.jpg
inflating: test/images/20230812_221708.jpg.rf.2f211999f6915c86d98eda9de7a1c5d.jpg
inflating: test/images/20230812_221804.jpg.rf.494390a32eb74ea02a25a318668790a5.jpg
```

```

] import warnings
warnings.filterwarnings('ignore')

] !pip install ultralytics --quiet

] from ultralytics import YOLO
model=YOLO('yolov8n.pt')

] Creating new ultralytics Settings v0.0.6 file
View Ultralytics Settings with 'yolo settings' or at '/root/.config/ultralytics/settings.json'
Update Settings with 'yolo settings key=value', i.e. 'yolo settings runs_dir=path/to/dir'. For help see https://docs.ultralytics.com/quickstart/#ultralytics-settings.
Downloading https://github.com/ultralytics/assets/releases/download/v8.3.0/yolov8n.pt to 'yolov8n.pt'...
100%|██████████| 6.25M/6.25M [00:00<00:00, 78.7MB/s]

] from ultralytics import YOLO
model=YOLO('yolov8n.pt')

] import os
import yaml
import glob
import random
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import torch
from ultralytics import YOLO

```

+ Code + Text Copy to Drive

Connect T4 Gemini

```

[ ] import torch
from torchvision.models.detection import fasterrcnn_resnet50_fpn
from torchvision.transforms import functional as F
from PIL import ImageDraw
from torchvision.transforms import ToTensor
from torch.utils.data import Dataset, DataLoader
from tqdm import tqdm

[ ] result = model.train(data="/content/data.yaml", epochs=50, save_period=10, seed=seed, name="yolo8n")

] Ultralytics 8.3.50 Python-3.10.12 torch-2.5.1+cu121 CUDA:0 (Tesla T4, 15102MiB)
engine/trainer: task=detect, mode=train, model=yolov8n.pt, data=/content/data.yaml, epochs=50, time=None, patience=100, batch=16, imgs=640, save=True, save_period=10, cache=False,
Downloading https://ultralytics.com/assets/Arial.ttf to '/root/.config/ultralytics/Arial.ttf'...
100%|██████████| 755k/755k [00:00<00:00, 18.3MB/s]
Overriding model.yaml nc=80 with nc=1

      from  n  params  module  arguments
0         -1  1      464  ultralytics.nn.modules.conv.Conv  [3, 16, 3, 2]
1         -1  1     4672  ultralytics.nn.modules.conv.Conv  [16, 32, 3, 2]
2         -1  1     7360  ultralytics.nn.modules.block.C2f  [32, 32, 1, True]
3         -1  1    18560  ultralytics.nn.modules.conv.Conv  [32, 64, 3, 2]
4         -1  2    49664  ultralytics.nn.modules.block.C2f  [64, 64, 2, True]
5         -1  1    73984  ultralytics.nn.modules.conv.Conv  [64, 128, 3, 2]
6         -1  2   197632  ultralytics.nn.modules.block.C2f  [128, 128, 2, True]
7         -1  1   295424  ultralytics.nn.modules.conv.Conv  [128, 256, 3, 2]
8         -1  1   460288  ultralytics.nn.modules.block.C2f  [256, 256, 1, True]
9         -1  1   164608  ultralytics.nn.modules.block.SPPF  [256, 256, 5]
10        -1  1         0  torch.nn.modules.upsampling.Upsample  [None, 2, 'nearest']
11      [-1, 6]  1         0  ultralytics.nn.modules.conv.Concat  [1]
12        -1  1   148224  ultralytics.nn.modules.block.C2f  [384, 128, 1]
13        -1  1         0  torch.nn.modules.upsampling.Upsample  [None, 2, 'nearest']
14      [-1, 4]  1         0  ultralytics.nn.modules.conv.Concat  [1]
15        -1  1   37248  ultralytics.nn.modules.block.C2f  [192, 64, 1]

```

Model Validation and Evaluation Report (5 marks):

Model	Summary	Training and Validation Performance Metrics
YOLOV8N	<pre> 36 epochs completed in 0.450 hours. optimizer stripped from runs/object/yolov8n/weights/last.pt, 4.29M optimizer stripped from runs/object/yolov8n/weights/best.pt, 4.29M Validating runs/object/yolov8n/weights/best.pt... Ultralytics 8.3.58 Python 3.10.12 torch 2.5.1+cu121 CUDA:0 (Tesla T4, 15102MiB) Model Summary (ncnn): 168 layers, 1.6M, 1.6M parameters, 0 gradients, 8.1 GFLOPs Class Images Instances BoxP R mAP0.5 mAP0.5:1000 all 364 8758 0.62 0.78 0.97 0.427 Speed: 6.3ms preprocess, 2.0ms inference, 8.8ms loss, 3.0ms postprocess per image Results saved in runs/object/yolov8n </pre>	Screenshot of the training and validation performance metrics (output of the model.fit()).