```
Tue Oct  1 13:03:44 2024
+---------------------------------------------------------------------------------------+
| NVIDIA-SMI 535.104.05             Driver Version: 535.104.05   CUDA Version: 12.2     |
|-----------------------------------------+----------------------+----------------------+
| GPU  Name                 Persistence-M | Bus-Id        Disp.A | Volatile Uncorr. ECC |
| Fan  Temp   Perf          Pwr:Usage/Cap |         Memory-Usage | GPU-Util  Compute M. |
|                                         |                      |               MIG M. |
|=========================================+======================+======================|
|   0  Tesla T4                       Off | 00000000:00:04.0 Off |                    0 |
| N/A   47C    P8              9W /  70W |      0MiB / 15360MiB |      0%      Default |
|                                         |                      |                  N/A |
+-----------------------------------------+----------------------+----------------------+

+---------------------------------------------------------------------------------------+
| Processes:                                                                            |
|  GPU   GI   CI        PID   Type   Process name                            GPU Memory |
|        ID   ID                                                             Usage      |
|=======================================================================================|
|  No running processes found                                                           |
+---------------------------------------------------------------------------------------+
```

Checking GPU Access

```
/content
```

Creating HOME Constant

```
Ultralytics 8.3.2 🚀 Python-3.10.12 torch-2.4.1+cu121 CUDA:0 (Tesla T4, 15102MiB)
Setup complete ✅ (2 CPUs, 12.7 GB RAM, 41.2/112.6 GB disk)
```

Install YOLO11 via Ultralytics

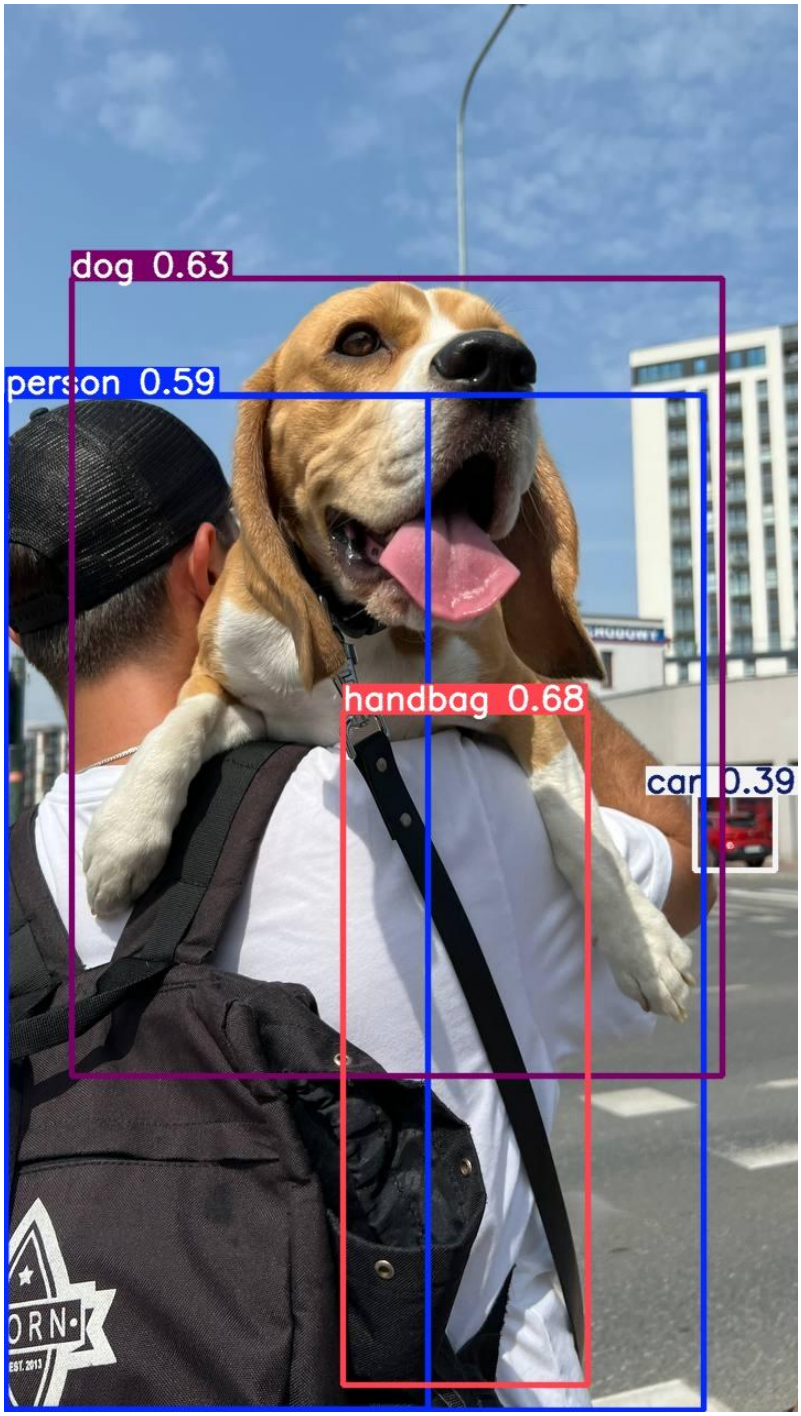
```
Installing collected packages: dill
Successfully installed dill-0.3.9

requirements: AutoUpdate success ✅ 2.3s, installed 1 package: ['dill']
requirements: ⚠️ Restart runtime or rerun command for updates to take effect

Ultralytics 8.3.2 🚀 Python-3.10.12 torch-2.4.1+cu121 CUDA:0 (Tesla T4, 15102MiB)
YOLO11n summary (fused): 238 layers, 2,616,248 parameters, 0 gradients, 6.5 GFLOPs

Downloading https://media.roboflow.com/notebooks/examples/dog.jpeg to 'dog.jpeg'...
100% 104k/104k [00:00<00:00, 44.7MB/s]
image 1/1 /content/dog.jpeg: 640x384 2 persons, 1 car, 1 dog, 1 handbag, 61.4ms
Speed: 11.7ms preprocess, 61.4ms inference, 773.5ms postprocess per image at shape (1, 3, 640, 384)
Results saved to runs/detect/predict
```

Inference with model pre-trained on COCO dataset



Display Annotated Image

```
tensor([[3.0705e+02, 6.4341e+02, 5.2919e+02, 1.2558e+03],
        [6.1400e+01, 2.4994e+02, 6.5165e+02, 9.7412e+02],
        [1.7803e+00, 3.5551e+02, 6.3404e+02, 1.2788e+03],
        [1.1933e+00, 3.5620e+02, 3.8455e+02, 1.2776e+03],
        [6.2615e+02, 7.1818e+02, 6.9975e+02, 7.8754e+02]], device='cuda:0')
```

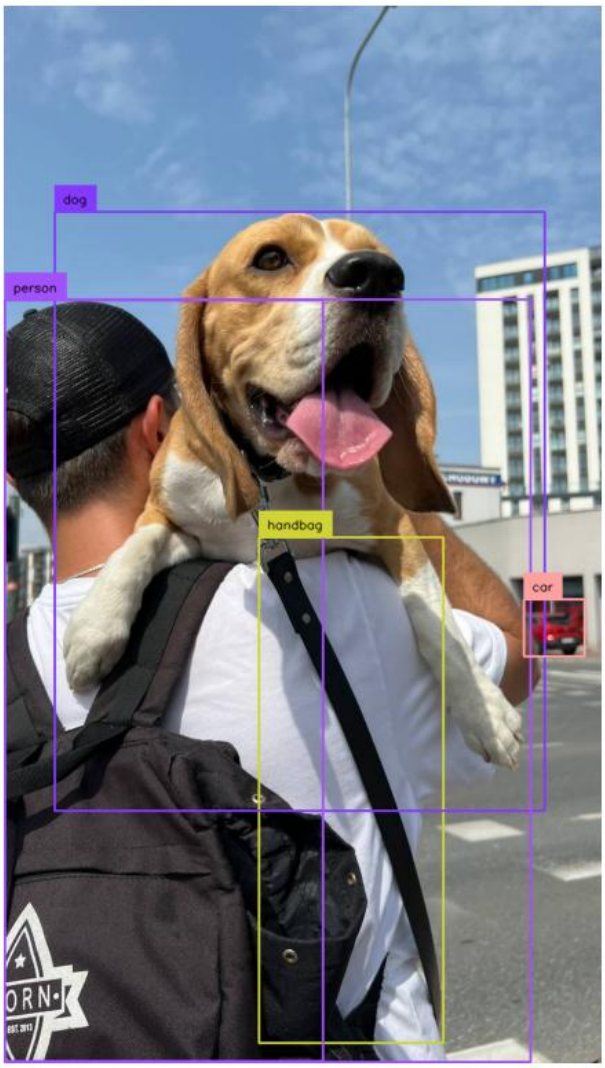
Location of Detected Objects

```
tensor([0.6832, 0.6284, 0.5941, 0.3923, 0.3875], device='cuda:0')
```

Configuration of Detected Objects

```
tensor([26., 16.,  0.,  0.,  2.], device='cuda:0')
```

Classes of Detected Objects



Annotating Detected Boxes

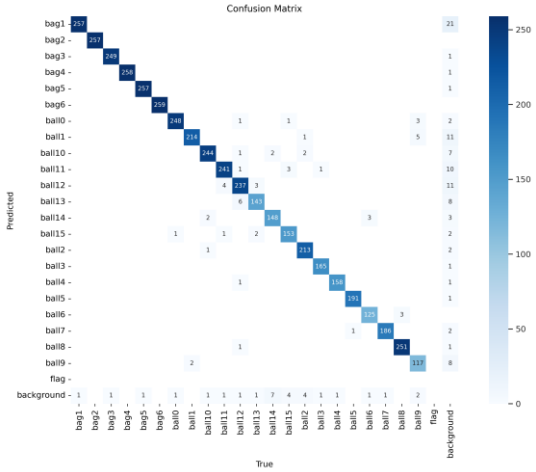
```
/content/datasets
loading Roboflow workspace...
loading Roboflow project...
Downloading Dataset Version Zip in 两点钟模型-3 to yolov11:: 100%|██████████| 22514/22514 [00:00<00:00, 28912.99it/s]

Extracting Dataset Version Zip to 两点钟模型-3 in yolov11:: 100%|██████████| 2612/2612 [00:00<00:00, 5820.46it/s]
```

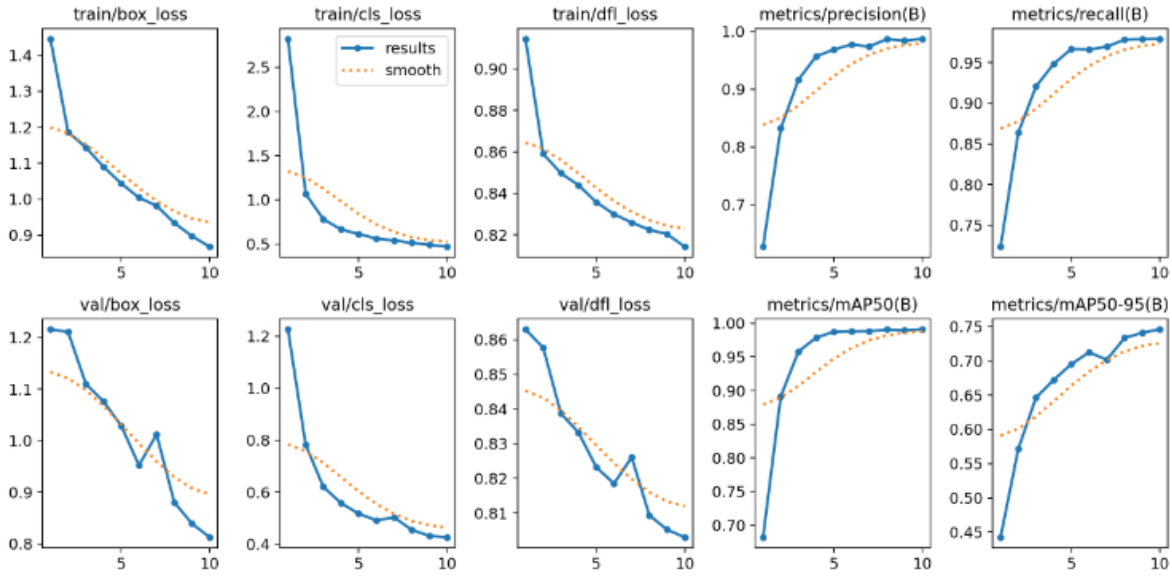
Downloading the Dataset

```
args.yaml                                       PR_curve.png          val_batch0_pred.jpg
confusion_matrix_normalized.png                 R_curve.png           val_batch1_labels.jpg
confusion_matrix.png                            results.csv           val_batch1_pred.jpg
events.out.tfevents.1727788453.c5dcf32815d2.3299.0  results.png       val_batch2_labels.jpg
F1_curve.png                                    train_batch0.jpg      val_batch2_pred.jpg
labels_correlogram.jpg                          train_batch1.jpg      weights
labels.jpg                                      train_batch2.jpg
P_curve.png                                     val_batch0_labels.jpg
```

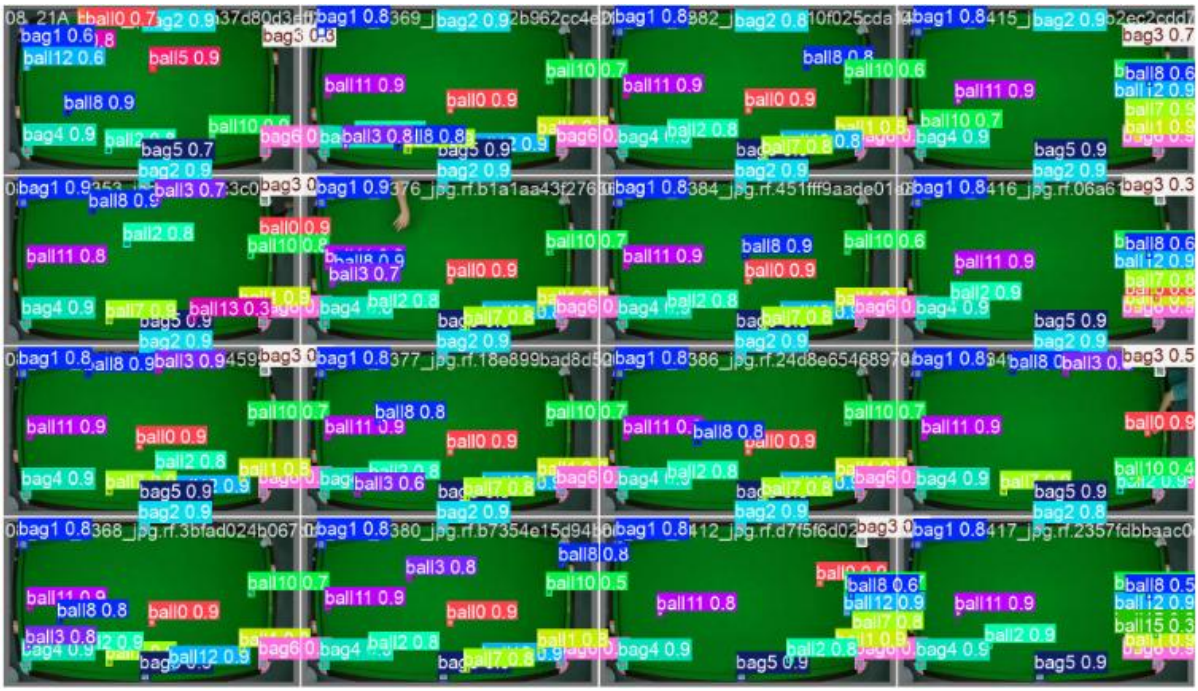
View Training Result



Confusion Matrix



Results over Epoch



Sample Prediction on validation dataset

```
Ultralytics 8.3.2 🚀 Python-3.10.12 torch-2.4.1+cu121 CUDA:0 (Tesla T4, 15102MiB)
YOLO11s summary (fused): 238 layers, 9,421,701 parameters, 0 gradients, 21.3 GFLOPs
val: Scanning /content/datasets/两点钟模型-3/valid/labels.cache... 259 images, 0 backgrounds, 0 corrupt: 100% 259/259 [00:00<?, ?it/s]
val: WARNING ⚠️ /content/datasets/两点钟模型-3/valid/images/08_21C_0250_jpg.rf.b164fca68a7a644a126019aa776912c1.jpg: 2 duplicate labels removed
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100% 17/17 [00:06<00:00,  2.59it/s]
                   all        259       4652      0.987      0.979      0.991      0.749
                  bag1        258        258      0.986      0.984      0.994       0.78
                  bag2        257        257      0.998          1      0.995      0.892
                  bag3        250        250          1      0.942      0.995      0.808
                  bag4        258        258      0.996          1      0.995      0.807
                  bag5        258        258      0.995      0.996      0.995        0.9
                  bag6        259        259      0.998          1      0.995       0.85
                 ball0        250        250      0.983      0.988      0.994      0.728
                 ball1        216        216      0.982      0.992      0.995      0.687
                ball10        248        248      0.976      0.968      0.993      0.714
                ball11        247        247      0.972      0.984      0.993      0.743
                ball12        248        249      0.992      0.976      0.992      0.714
                ball13        149        149      0.967      0.986      0.992      0.662
                ball14        155        157      0.967      0.926      0.963      0.747
                ball15        161        161      0.975       0.95      0.974      0.702
                 ball2        219        220      0.991      0.971      0.989      0.712
                 ball3        167        167          1      0.992      0.995      0.677
                 ball4        159        159          1      0.991      0.995      0.723
                 ball5        192        192          1          1      0.995      0.748
                 ball6        129        129      0.976      0.965      0.989      0.673
                 ball7        187        187      0.993      0.989      0.995      0.717
                 ball8        251        254      0.991      0.988      0.992      0.736
                 ball9        127        127      0.984      0.946      0.987      0.768
Speed: 0.1ms preprocess, 6.3ms inference, 0.0ms loss, 3.8ms postprocess per image
Results saved to runs/detect/val
💡 Learn more at https://docs.ultralytics.com/modes/val
```

Validating the Fine-Tuned Model

Validating through Image Visualization