



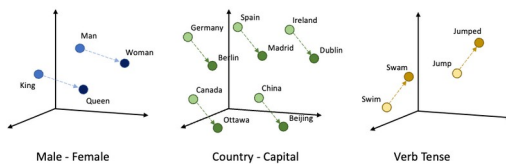
Bao Tai Le

Masterthesis update

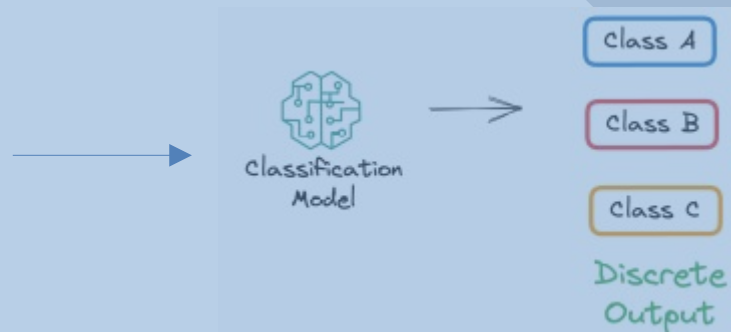
WiSe 2024/25
10.12.2024

So where am I
today

Embedding Network



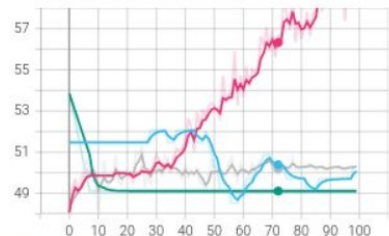
Classification Network



filters in chart scaling

Accuracy

Accuracy
tag: Accuracy



default

0.6

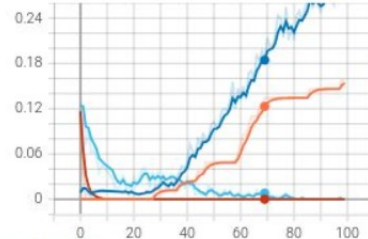
RELATIVE

Name	Smoothed	Value	Step	Time	Relative
2024-12-04/Experiment/Model/Accuracy_test_accuracy	50.39	50.3	72	Wed Dec 4, 22:05:12	5s
2024-12-04/Experiment/Model/Accuracy_train_accuracy	56.33	56.64	72	Wed Dec 4, 22:05:12	5s
2024-12-09/Experiment_Embedded_Data/Model/Accuracy_test_accuracy	49.11	49.11	72	Mon Dec 9, 22:52:50	5s
2024-12-09/Experiment_Embedded_Data/Model/Accuracy_train_accuracy	50.18	50	72	Mon Dec 9, 22:52:50	5s

filters in chart scaling

Sensitivity

Sensitivity
tag: Sensitivity



default

0.6

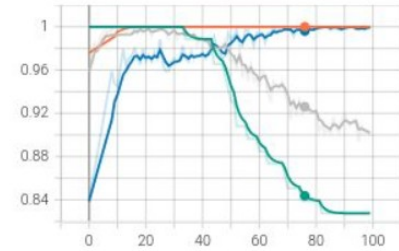
Axis

RELATIVE

Name	Smoothed	Value	Step	Time	Relative
2024-12-04/Experiment/Model/Sensitivity_test_sensitivity	0.123	0.1341	69	Wed Dec 4, 22:05:12	5s
2024-12-04/Experiment/Model/Sensitivity_train_sensitivity	0.1844	0.1848	69	Wed Dec 4, 22:05:12	5s
2024-12-09/Experiment_Embedded_Data/Model/Sensitivity_test_sensitivity	9.545e-17	0	69	Mon Dec 9, 22:52:50	4s
2024-12-09/Experiment_Embedded_Data/Model/Sensitivity_train_sensitivity	8.1058e-3	8.9021e-3	69	Mon Dec 9, 22:52:50	4s

Name	Smoothed	Value	Step	Time	Relative
2024-12-04/Experiment/Model/Specificity_test_specificity	0.8437	0.8391	76	Wed Dec 4, 22:05:12	5s
2024-12-04/Experiment/Model/Specificity_train_specificity	0.926	0.9288	76	Wed Dec 4, 22:05:12	5s
2024-12-09/Experiment_Embedded_Data/Model/Specificity_test_specificity	1	1	76	Mon Dec 9, 22:52:50	5s
2024-12-09/Experiment_Embedded_Data/Model/Specificity_train_specificity	0.9959	0.9941	76	Mon Dec 9, 22:52:50	5s

tag: Specificity

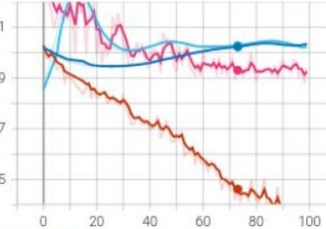


filters in chart scaling

filters in chart scaling

Loss

Loss
tag: Loss



default

0.6

RELATIVE

Name	Smoothed	Value	Step	Time	Relative
2024-12-04/Experiment/Model/Loss_test_Loss	0.7023	0.7025	73	Wed Dec 4, 22:05:12	5s
2024-12-04/Experiment/Model/Loss_train_Loss	0.6462	0.6462	73	Wed Dec 4, 22:05:12	5s
2024-12-09/Experiment_Embedded_Data/Model/Loss_test_Loss	0.7028	0.703	73	Mon Dec 9, 22:52:50	5s
2024-12-09/Experiment_Embedded_Data/Model/Loss_train_Loss	0.693	0.6925	73	Mon Dec 9, 22:52:50	5s



What to do?

Calculate new triplets after each epoch
As the model improves

```
for epoch in tqdm(range(epochs)):
```

```
    #Form the new Hardbatches based on the new model and train it on it  
    train_hard_batch=create_hard_batch(batch_size = train_batch_size,  
                                       num_hard=int(np.ceil(0.5*train_batch_size)),  
                                       feature_size = dataset.input_size(),  
                                       val_indices = train_indices,  
                                       train_indices = val_indices,  
                                       dataset = dataset,  
                                       embedding_model = model.embedding_net,  
                                       split ="train" )
```

```
    print(f"[INFO] Created {len(train_hard_batch)} new Triplets based on the new model!")
```

```
    # Calculate the Train Loss
```

```
    train_loss = triplett_train_step(model =model,  
                                     train_hard_batch= train_hard_batch,  
                                     loss_fn=loss_fn,  
                                     scheduler =scheduler,  
                                     optimizer = optimizer)
```

```
    # Calculate the Test Loss
```

```
    test_loss = triplett_test_step(model=model,  
                                   test_hard_batch=test_batch,  
                                   scheduler=scheduler,  
                                   loss_fn=loss_fn)
```

```
    # Update results dictionary
```

```
    results["train_loss"].append(train_loss)  
    results["test_loss"].append(test_loss)
```

0.2.3 Determine how many unique entries we have

```
In [4]: NUMBER_OF_SIGNAL = sum1forline(DATASET_DIR + BKG_nodup)
NUMBER_OF_BKG = sum1forline(DATASET_DIR + SIG_nodup)

print(f"num_events_BKG : {NUMBER_OF_BKG}")
print(f"num_events_SIG : {NUMBER_OF_SIGNAL}")
```

```
num_events_BKG : 424
num_events_SIG : 1344
```

- MORE Data

- Different Archetctures