

Training results

Model	MLP	epoch	GNN	epoch
CWE-120				
train_loss start	0.694	55	0.626	6
train_loss end	0.585		0.601	
val_loss start	0.685		0.564	
val_loss end	0.594		0.599	
CWE-119				
train_loss start	0.692	54	0.620	8
train_loss end	0.530		0.547	
val_loss start	0.675		0.567	
val_loss end	0.549		0.542	
CWE-469				
train_loss start	0.693	25	0.795	20
train_loss end	0.594		0.565	
val_loss start	0.688		0.589	
val_loss end	0.601		0.590	
CWE-476				
train_loss start	0.693	42	0.707	9
train_loss end	0.670		0.680	
val_loss start	0.692		0.707	
val_loss end	0.684		0.680	
CWE-OTHERS				
train_loss start	0.694	48	0.658	6
train_loss end	0.627		0.643	
val_loss start	0.684		0.630	
val_loss end	0.637		0.653	
CWE-COMBINED				

train_loss start	0.693	56	0.650	6
train_loss end	0.632		0.639	
val_loss start	0.687		0.610	
val_loss end	0.634		0.632	

Classification results

Model	Accuracy	Precision	Recall	F1-Score
CWE-120				
SVM	0.665	0.667	0.677	0.672
MLP	0.681	0.682	0.686	0.684
GNN	0.671	0.637	0.779	0.701
CWE-119				
SVM	0.704	0.697	0.715	0.706
MLP	0.719	0.721	0.723	0.722
GNN	0.731	0.716	0.779	0.746
CWE-469				
SVM	0.693	0.732	0.631	0.678
MLP	0.660	0.634	0.776	0.698
GNN	0.746	0.752	0.761	0.756
CWE-476				
SVM	0.559	0.582	0.423	0.490
MLP	0.562	0.573	0.574	0.574
GNN	0.543	0.532	0.660	0.589
CWE-OTHERS				
SVM	0.621	0.627	0.601	0.614
MLP	0.640	0.663	0.598	0.629
GNN	0.625	0.620	0.657	0.638

CWE-COMBINED				
SVM	0.631	0.636	0.615	0.625
MLP	0.643	0.637	0.675	0.655
GNN	0.638	0.621	0.708	0.661

Configuring the hyperparameter C of the linear-SVM

C Value	Accuracy	Precision	Recall	F1-Score
CWE-120				
0.001	0.666	0.669	0.676	0.672
0.01	0.665	0.666	0.679	0.672
0.1	0.666	0.667	0.681	0.674
1	0.665	0.667	0.677	0.672
10	0.634	0.676	0.535	0.597
100	0.588	0.613	0.510	0.557
1000	0.595	0.618	0.524	0.567
10 ¹²	0.559	0.582	0.461	0.515

Training MLP & GNN on CWE-120 with different number of linear layers

Linear layers	Accuracy	Precision	Recall	F1-Score
CWE-120				
MLP				
3	0.681	0.682	0.686	0.684
4	0.682	0.683	0.681	0.685
5	0.682	0.676	0.706	0.691
20	0.497	1.0	0.0	0.0
GNN				
3	0.671	0.637	0.779	0.701
4	0.674	0.663	0.703	0.682

5	0.667	0.656	0.711	0.682
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Training GNN on CWE-120 with different number of GCNConv layers

GCNConv layers	Accuracy	Precision	Recall	F1-Score
CWE-120				
3	0.671	0.637	0.779	0.701
4	0.670	0.692	0.617	0.653
5	0.659	0.661	0.658	0.660
10	0.673	0.657	0.716	0.685
20	0.488	0.488	1.0	0.656