Validation Results

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This document contains results from cross-validation exercises.

1. Summary: baseline_220407

Configuration

- Name: `baseline_220407`
- Number of epochs: `30`
- Learning rate: `0.0001`
- Batch size: `128`
- Number of folds: `5`
- Seed: `123`

Figure 1: Final Epoch Metrics

Fold	Loss		Accuracy	
	Train	Validation	Train	Validation
0	0.251	0.386	0.907	0.855
1	0.248	0.357	0.908	0.861
2	0.258	0.406	0.908	0.84
3	0.246	0.437	0.904	0.84
4	0.251	0.416	0.906	0.846

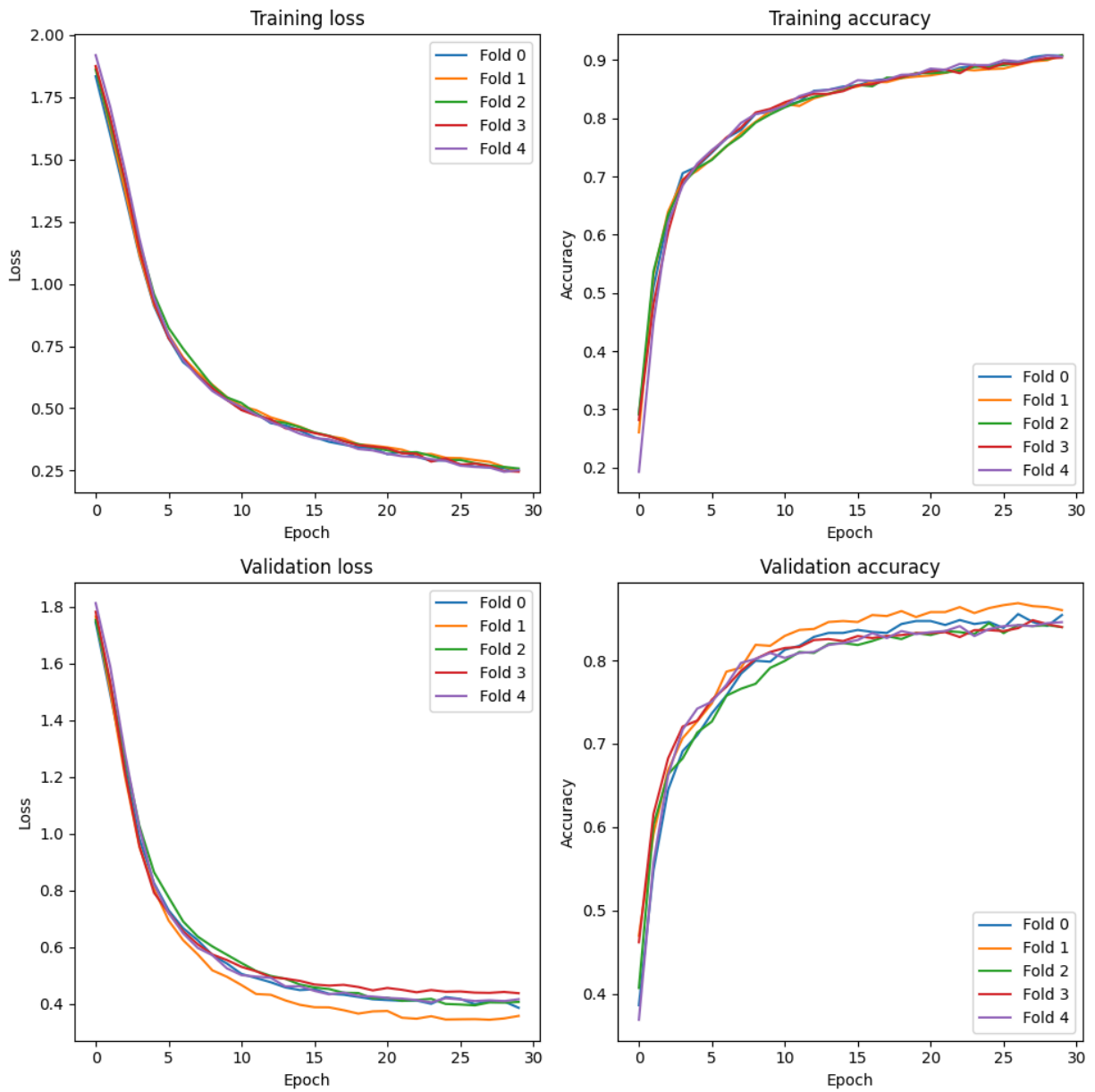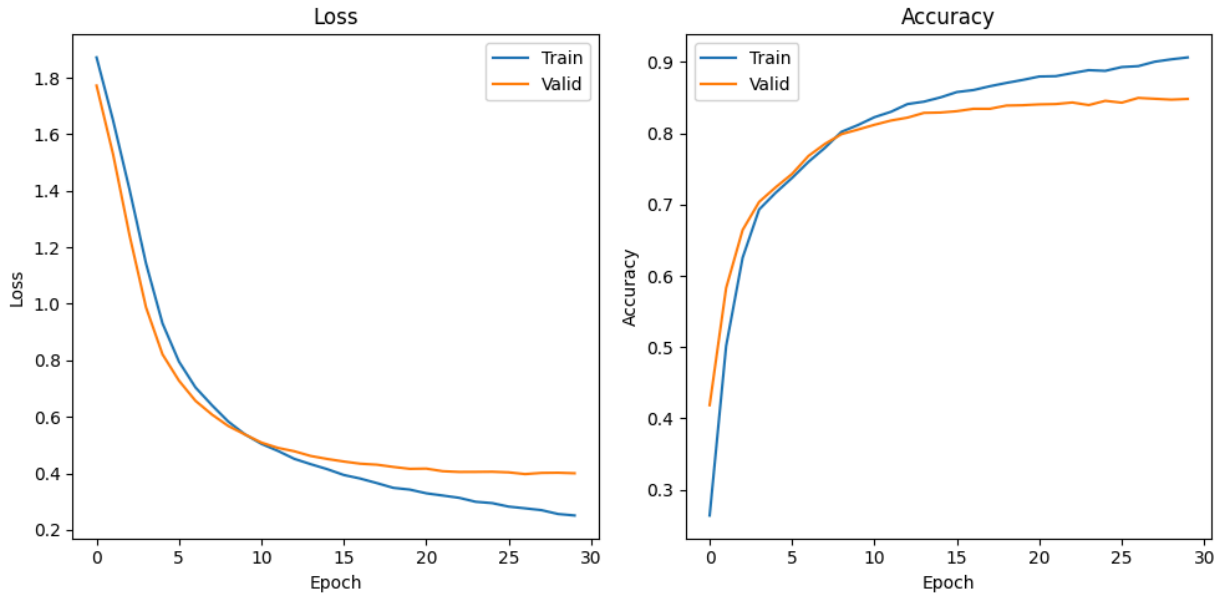Figure 2: Loss and Accuracy Histories, All Folds

Figure 3: Loss and Accuracy Histories, Average

Abbreviations:
- FA: fall armyworm
- Gr: grasshopper
- He: healthy
- Be: leaf beetle
- Bl: leaf blight
- Sp: leaf spot
- SV: streak virus

Figure 4: Confusion Matrix, Fold 0, Train

| Label | Prediction | | | | | | | Recall |
	FA	Gr	He	Be	Bl	Sp	SV	
FA	172	1	0	3	1	5	2	0.935
Gr	0	413	0	6	0	1	0	0.983
He	0	1	121	0	0	6	3	0.924
Be	1	2	0	575	0	7	0	0.983
Bl	3	0	0	3	525	89	15	0.827
Sp	3	0	18	2	65	678	19	0.864
SV	5	1	0	3	17	30	557	0.909
Precision	0.935	0.988	0.871	0.971	0.863	0.831	0.935	

Figure 5: Confusion Matrix, Fold 0, Validation

Label	Prediction							Recall
	FA	Gr	He	Be	Bl	Sp	SV	
FA	42	2	0	1	0	1	0	0.913
Gr	0	101	0	4	0	0	0	0.962
He	0	0	28	0	0	4	0	0.875
Be	1	3	1	140	0	2	0	0.952
Bl	1	1	0	0	110	40	7	0.692
Sp	1	0	6	1	23	164	2	0.832
SV	1	0	0	0	8	12	132	0.863
Precision	0.913	0.944	0.800	0.959	0.780	0.735	0.936	

Figure 6: Confusion Matrix, Fold 1, Train

Label	Prediction							Recall
	FA	Gr	He	Be	Bl	Sp	SV	
FA	176	2	0	1	0	3	2	0.957
Gr	0	412	0	5	0	3	0	0.981
He	0	0	118	1	0	12	0	0.901
Be	3	2	1	578	0	1	0	0.988
Bl	4	1	0	1	528	85	17	0.830
Sp	2	0	19	4	67	669	24	0.852
SV	1	1	1	1	20	25	563	0.920
Precision	0.946	0.986	0.849	0.978	0.859	0.838	0.929	

Figure 7: Confusion Matrix, Fold 1, Validation

Label	Prediction							Recall
	FA	Gr	He	Be	Bl	Sp	SV	
FA	41	0	0	0	0	5	0	0.891
Gr	0	105	0	0	0	0	0	1.000
He	0	1	28	0	0	3	0	0.875
Be	1	6	1	139	0	0	0	0.946
Bl	0	3	0	0	108	42	5	0.684
Sp	1	1	4	0	18	171	2	0.868
SV	3	0	0	0	1	20	130	0.844
Precision	0.891	0.905	0.848	1.000	0.850	0.710	0.949	

Figure 8: Confusion Matrix, Fold 2, Train

Label	FA	Gr	He	Be	Bl	Sp	SV	Recall
				Prediction				
FA	172	3	0	0	4	3	2	0.935
Gr	0	414	0	4	0	2	0	0.986
He	0	1	116	1	0	9	3	0.892
Be	3	2	0	577	0	3	1	0.985
Bl	1	0	0	2	533	80	19	0.839
Sp	2	1	14	0	81	676	12	0.860
SV	2	0	1	2	14	36	558	0.910
Precision	0.956	0.983	0.885	0.985	0.843	0.836	0.938	

Figure 9: Confusion Matrix, Fold 2, Validation

Label	FA	Gr	He	Be	Bl	Sp	SV	Recall
				Prediction				
FA	40	2	0	3	0	1	0	0.870
Gr	0	103	0	2	0	0	0	0.981
He	0	0	31	0	0	2	0	0.939
Be	0	1	0	143	0	2	0	0.979
Bl	0	1	0	0	105	45	8	0.660
Sp	0	1	4	1	27	151	12	0.770
SV	0	0	1	1	5	15	131	0.856
Precision	1.000	0.954	0.861	0.953	0.766	0.699	0.868	

Figure 10: Confusion Matrix, Fold 3, Train

Label	FA	Gr	He	Be	Bl	Sp	SV	Recall
				Prediction				
FA	175	0	0	2	1	6	0	0.951
Gr	0	412	0	5	0	2	1	0.981
He	0	1	119	2	0	7	1	0.915
Be	2	5	1	575	0	2	1	0.981
Bl	1	0	1	0	514	99	20	0.809
Sp	2	1	20	2	70	671	20	0.854
SV	2	1	1	0	17	26	566	0.923
Precision	0.962	0.981	0.838	0.981	0.854	0.825	0.929	

Figure 11: Confusion Matrix, Fold 3, Validation

Label	Prediction							Recall
	FA	Gr	He	Be	Bl	Sp	SV	
FA	38	2	0	0	3	2	1	0.826
Gr	0	100	0	3	1	1	0	0.952
He	1	0	30	1	0	1	0	0.909
Be	2	1	1	138	0	2	2	0.945
Bl	1	0	0	0	121	31	6	0.761
Sp	0	2	11	0	29	143	11	0.730
SV	1	0	0	1	8	9	134	0.876
Precision	0.884	0.952	0.714	0.965	0.747	0.757	0.870	

Figure 12: Confusion Matrix, Fold 4, Train

Label	Prediction							Recall
	FA	Gr	He	Be	Bl	Sp	SV	
FA	177	1	0	2	0	3	1	0.962
Gr	1	411	0	7	0	1	0	0.979
He	0	2	115	0	0	11	2	0.885
Be	4	2	2	573	1	3	1	0.978
Bl	2	1	0	1	526	93	12	0.828
Sp	2	1	18	2	65	678	20	0.863
SV	2	0	1	2	26	24	558	0.910
Precision	0.941	0.983	0.846	0.976	0.851	0.834	0.939	

Figure 13: Confusion Matrix, Fold 4, Validation

Label	Prediction							Recall
	FA	Gr	He	Be	Bl	Sp	SV	
FA	40	1	0	0	1	4	0	0.870
Gr	0	100	0	1	2	2	0	0.952
He	0	0	27	0	0	5	1	0.818
Be	0	1	0	144	0	1	0	0.986
Bl	0	0	0	0	118	34	7	0.742
Sp	1	1	5	0	25	153	11	0.781
SV	0	0	0	1	3	22	127	0.830
Precision	0.976	0.971	0.844	0.986	0.792	0.692	0.870	