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Cihat Kaya

During these two weeks, we trained Alexnet, resnet152, Vgg-16, Densenet201 models. We compared our results below and observed which one worked with the best performance.

Vgg-16:

epoch	train_loss	valid_loss	accuracy	time
0	0.779368	0.652089	0.817169	15:12
epoch	train_loss	valid_loss	accuracy	time
0	0.656514	0.612332	0.829996	23:32
1	0.642626	0.592099	0.833146	23:27
2	0.596709	0.580846	0.832021	23:13
3	0.527094	0.582993	0.832808	23:49
4	0.496308	0.583779	0.832696	21:48

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		Confusion matrix					
Actual	Accessories	1875	277	113	0	16	0
	Apparel	247	3732	238	0	37	0
	Footwear	160	265	1380	0	22	0
	Free Items	13	1	1	0	1	0
	Personal Care	20	42	27	0	414	0
	Sporting Goods	1	5	1	0	0	0
		Predicted					
		Accessories	Apparel	Footwear	Free Items	Personal Care	Sporting Goods

Alexnet:

epoch	train_loss	valid_loss	accuracy	time
0	0.789520	0.725821	0.802655	18:15
epoch	train_loss	valid_loss	accuracy	time
0	0.674700	0.627406	0.819757	18:03
1	0.657751	0.622507	0.818294	18:11
2	0.601286	0.604861	0.825270	19:58
3	0.520473	0.605702	0.824482	18:11
4	0.446846	0.617890	0.826733	17:55

		Confusion matrix					
Actual	Accessories	1854	257	104	0	23	0
	Apparel	272	3753	255	0	36	0
	Footwear	169	281	1352	0	32	0
	Free Items	23	3	1	0	0	0
	Personal Care	16	33	28	0	389	0
	Sporting Goods	1	5	1	0	0	0
		Predicted					
		Accessories	Apparel	Footwear	Free Items	Personal Care	Sporting Goods

Densenet 201:

epoch	train_loss	valid_loss	accuracy	time
0	0.721381	0.707190	0.814469	16:21

epoch	train_loss	valid_loss	accuracy	time
0	0.627753	0.620149	0.822907	23:16
1	0.584238	0.610033	0.824820	21:56
2	0.493816	0.637652	0.818857	23:44
3	0.233019	0.841189	0.810644	21:18
4	0.078110	0.994564	0.809068	21:24

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		Confusion matrix					
Actual	Accessories	1757	319	129	1	11	0
	Apparel	294	3696	250	0	45	1
	Footwear	167	347	1320	1	18	0
	Free Items	11	8	0	0	1	0
	Personal Care	17	43	28	0	418	0
	Sporting Goods	1	4	0	0	1	0
		Predicted					
		Accessories	Apparel	Footwear	Free Items	Personal Care	Sporting Goods

ResNet 152:

epoch	train_loss	valid_loss	accuracy	time
0	0.783401	0.690447	0.806031	18:32

epoch	train_loss	valid_loss	accuracy	time
0	0.630265	0.617421	0.820882	22:21
1	0.581335	0.608915	0.821782	24:17
2	0.465457	0.626763	0.818857	24:07
3	0.221868	0.835549	0.802655	20:38
4	0.069806	0.966914	0.807268	20:39

		Confusion matrix					
Actual	Accessories	1762	307	141	1	6	0
	Apparel	278	3675	291	0	39	0
	Footwear	176	316	1329	1	31	0
	Free Items	19	3	0	1	0	0
	Personal Care	23	52	26	0	408	0
	Sporting Goods	0	3	0	0	0	0
		Predicted					
		Accessories	Apparel	Footwear	Free Items	Personal Care	Sporting Goods

From the results we obtained, we saw that vgg-16 is the most performing model. It makes predictions with 83% success. VGG16 is a 16-layer deep learning model and is known to perform well in learning complex tasks. Resnet152 is a 152-layer deep learning model and is more complex than VGG16. However, as seen in the graph, Resnet152 has lower accuracy than VGG16. This suggests that Resnet152 may be overfitting the training dataset. AlexNet and DenseNet201 are less complex deep learning models. As seen in the table, these models have lower accuracy than VGG16 and Resnet152.