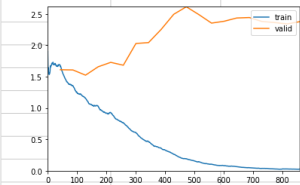
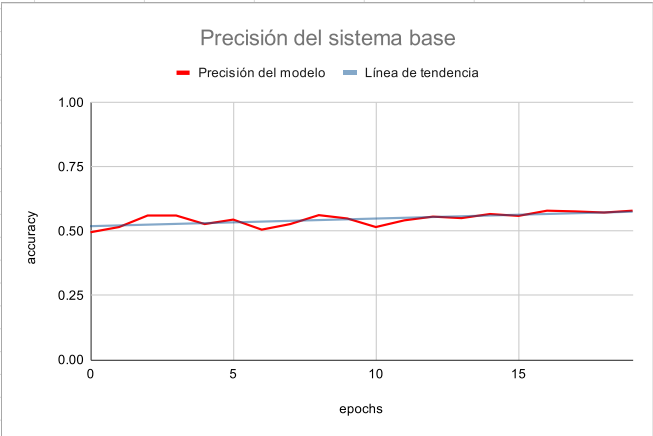
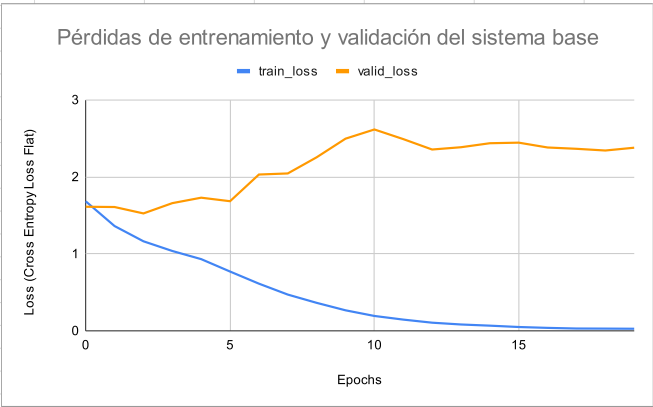


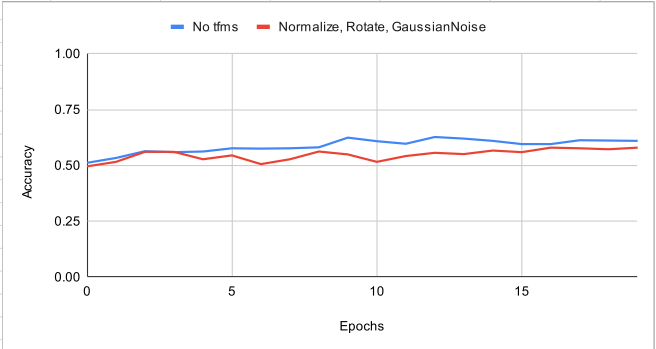
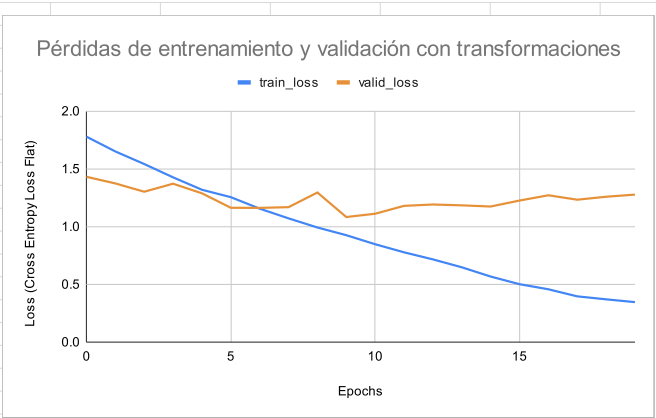
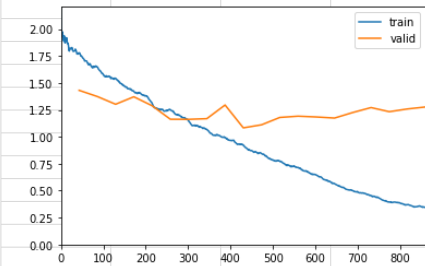
epoch	train_loss	valid_loss	accuracy	time
0	2.317927599	1.78781724	0.4667630196	0:16
epoch	train_loss	valid_loss	accuracy	time
0	1.681963682	1.611115217	0.4956647456	0:21
1	1.360291362	1.607616067	0.5158959627	0:21
2	1.162471533	1.524401307	0.5606936216	0:21
3	1.03654182	1.657947302	0.5606936216	0:21
4	0.9306744337	1.728774428	0.5274566412	0:21
5	0.7695478797	1.68304491	0.5447976589	0:21
6	0.6120880246	2.029729843	0.5057803392	0:21
7	0.4703301191	2.043738365	0.5274566412	0:21
8	0.3629362881	2.253570318	0.5621387362	0:21
9	0.2659854293	2.495422602	0.5491329432	0:21
10	0.1926295906	2.614865541	0.5158959627	0:21
11	0.1452496201	2.489884853	0.5419074893	0:21
12	0.1051418632	2.354524374	0.556358397	0:21
13	0.08180067688	2.384248495	0.5505780578	0:21
14	0.06658942252	2.436229467	0.5664739609	0:21
15	0.04906158149	2.44367981	0.5592485666	0:21
16	0.03778416291	2.380904436	0.579479754	0:21
17	0.02936205454	2.363767862	0.5765895844	0:21
18	0.02819979005	2.341609478	0.5722543597	0:21
19	0.02650559694	2.377992153	0.579479754	0:21



		Confusion matrix					
Actual	DISK	123	19	34	3	2	10
	DISKIRR	32	27	7	1	1	2
	DISKSPH	27	8	115	3	0	58
	IRR	3	7	6	1	1	4
	NONE	7	2	8	2	5	12
	SPH	6	3	17	3	3	130
		DISK	DISKIRR	DISKSPH	IRR	NONE	SPH
		Predicted					



epoch	train_loss	valid_loss	accuracy	time
0	2.314461946	1.617352486	0.478323698	0:16
epoch	train_loss	valid_loss	accuracy	time
0	1.778689504	1.431185722	0.5115606785	0:22
1	1.650754929	1.373741865	0.5332369804	0:21
2	1.541892052	1.301956892	0.5635837913	0:21
3	1.426496983	1.37142694	0.5592485666	0:22
4	1.31904459	1.288236737	0.5621387362	0:22
5	1.254894018	1.162985921	0.5765895844	0:21
6	1.155347109	1.161985874	0.5751445293	0:21
7	1.071283221	1.16829145	0.5765895844	0:21
8	0.9922633767	1.295105338	0.5809248686	0:22
9	0.92556566	1.082885385	0.6242774725	0:22
10	0.8473194242	1.111309767	0.6083815098	0:22
11	0.7773292661	1.179589748	0.5968208313	0:22
12	0.716132164	1.191271186	0.6271676421	0:22
13	0.6476797462	1.18405509	0.6199421883	0:21
14	0.5674759746	1.173814893	0.6098265648	0:22
15	0.5013081166	1.225464344	0.5953757167	0:22
16	0.4572502971	1.271199346	0.5953757167	0:21
17	0.3959013224	1.232964635	0.6127167344	0:22
18	0.3701893687	1.258458972	0.6112716794	0:21
19	0.3458628953	1.27706182	0.6098265648	0:21
		0.931		
Promedio		0.839		



		Confusion matrix					
Actual	DISK	137	29	33	0	2	4
	DISKIRR	29	25	4	4	4	1
	DISKSPH	32	2	121	2	3	46
	IRR	4	7	3	0	0	6
	NONE	4	0	6	1	5	15
	SPH	2	0	23	1	4	133
		DISK	DISKIRR	DISKSPH	IRR	NONE	SPH
		Predicted					

Pérdidas de entrenamiento y validación con ResNet18

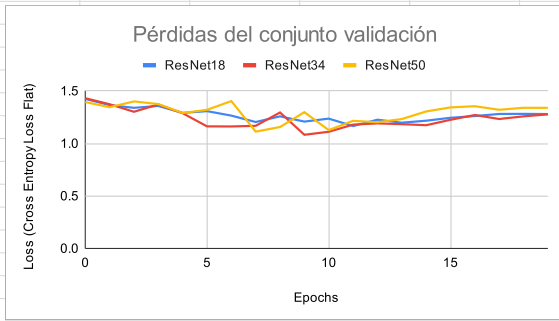
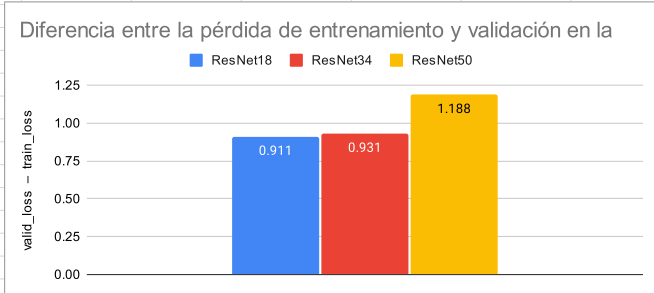
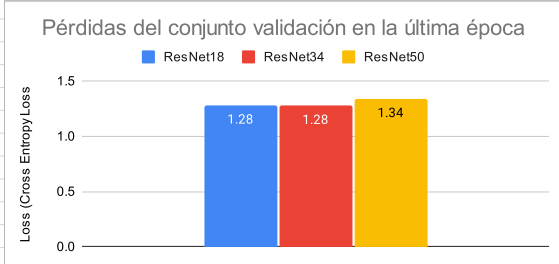
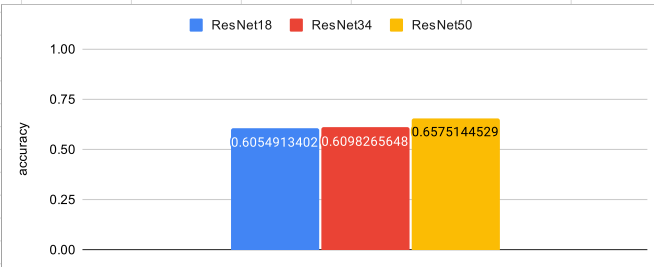
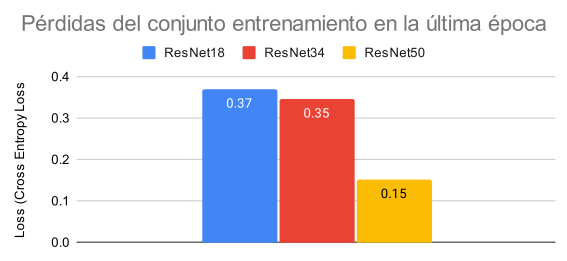
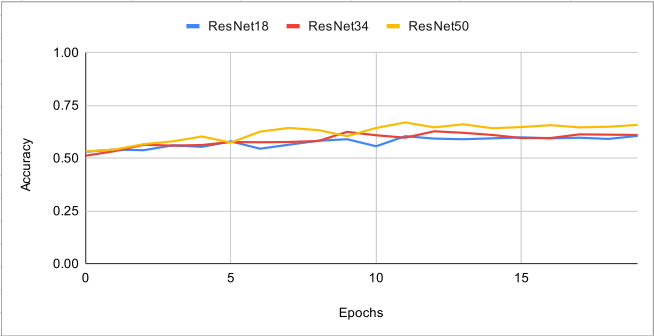
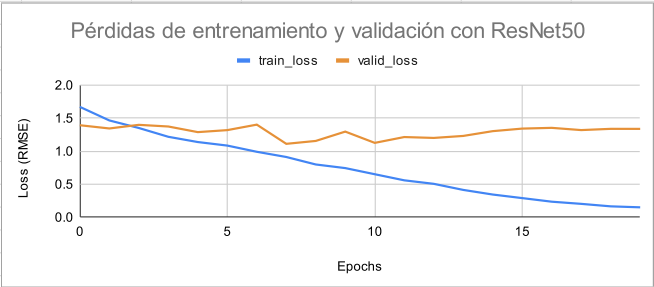
train_loss valid_loss

Loss [RMSE]

Epochs

Epochs	train_loss	valid_loss
0	1.75	1.40
1	1.60	1.35
2	1.45	1.35
3	1.35	1.35
4	1.25	1.30
5	1.15	1.30
6	1.05	1.25
7	0.95	1.15
8	0.85	1.25
9	0.75	1.20
10	0.65	1.20
11	0.55	1.10
12	0.45	1.20
13	0.35	1.15
14	0.25	1.20
15	0.15	1.20
16	0.10	1.25
17	0.05	1.25
18	0.05	1.25
19	0.05	1.25
20	0.05	1.25

epoch	train_loss	valid_loss	accuracy	time
0	2.342608213	1.9286443	0.5187861323	0:26
epoch	train_loss	valid_loss	accuracy	time
0	1.672735095	1.394660234	0.5317919254	0:34
1	1.467092395	1.345567822	0.5404624343	0:33
2	1.35274291	1.400519013	0.5664739609	0:34
3	1.21948874	1.375313163	0.579479754	0:34
4	1.139940977	1.290207744	0.6026011705	0:34
5	1.08645153	1.320526004	0.5736994147	0:34
6	0.9925195575	1.403696656	0.6257225275	0:34
7	0.9135397673	1.112894177	0.6430636048	0:34
8	0.8003078103	1.156771779	0.6329479814	0:34
9	0.745485425	1.298178077	0.6040462255	0:34
10	0.6526940465	1.127429008	0.6430636048	0:34
11	0.5602974296	1.215606689	0.6690751314	0:34
12	0.5072761774	1.202314734	0.6459537745	0:34
13	0.415151149	1.232545614	0.6604046226	0:34
14	0.3451267481	1.304955125	0.6416184902	0:34
15	0.2911316454	1.343629599	0.6473988295	0:34
16	0.2368375212	1.354894519	0.6560693383	0:34
17	0.2039549649	1.321080685	0.6459537745	0:34
18	0.1662368774	1.339874268	0.6488439441	0:34
19	0.1514505148	1.339353561	0.6575144529	0:34
Ultima epoca		1.188		
Promedio		1.13		



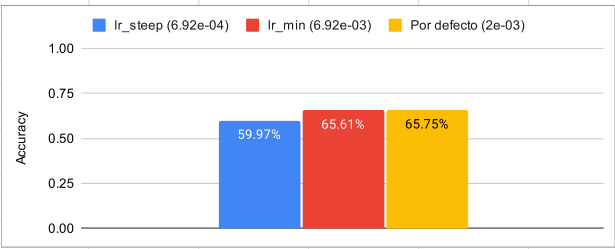
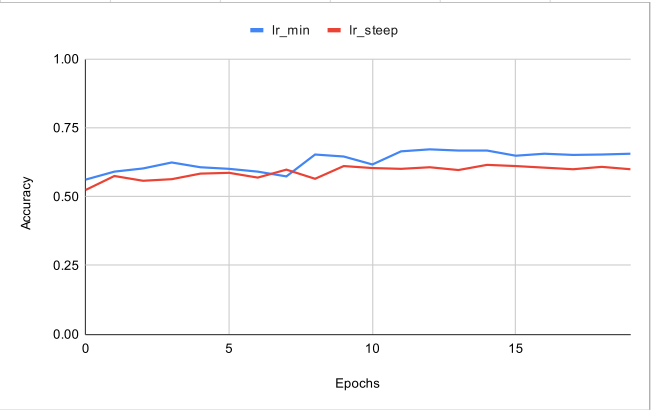
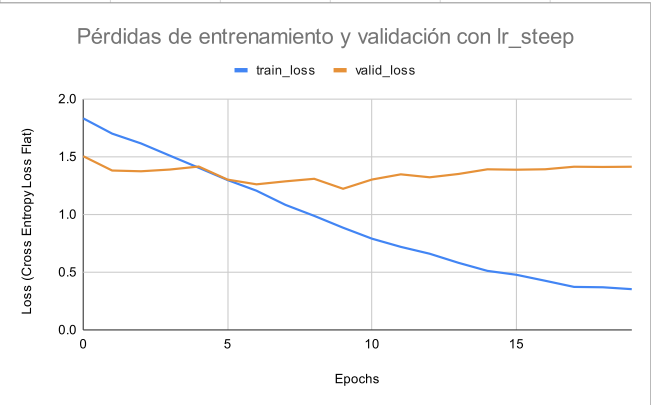
epoch	train_loss	valid_loss	accuracy	time
0	2.320463419	2.027053595	0.4479768872	0:43
epoch	train_loss	valid_loss	accuracy	time
0	1.718696237	1.454233646	0.5404624343	0:56
1	1.516379595	1.463392019	0.556358397	0:56
2	1.389808655	1.435674906	0.5419074893	0:56
3	1.293040156	1.324739575	0.5375722647	0:56
4	1.204161286	1.186872244	0.6026011705	0:56
5	1.112443089	1.335440755	0.5939306617	0:56
6	0.9975447655	1.237635612	0.5419074893	0:56
7	0.9406098127	1.032482982	0.6286126971	0:57
8	0.8201460242	1.280231953	0.6083815098	0:56
9	0.7610819936	1.072755456	0.6271676421	0:56
10	0.6776173115	1.069613457	0.6604046226	0:57
11	0.6044451594	1.148373485	0.6040462255	0:56
12	0.5534838438	1.055345178	0.6372832656	0:57
13	0.4568986595	1.169264555	0.6690751314	0:56
14	0.3759961724	1.188047051	0.6416184902	0:56
15	0.3097077906	1.165810466	0.6473988295	0:56
16	0.2640610039	1.17535758	0.6517341137	0:56
17	0.2197804302	1.182331324	0.6676300764	0:56
18	0.1847535521	1.213336349	0.6488439441	0:56
19	0.1652983129	1.194702744	0.6488439441	0:56



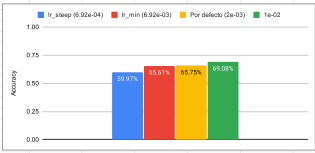
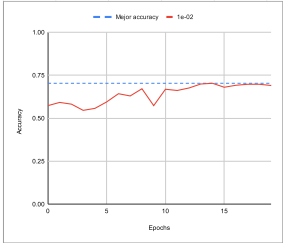
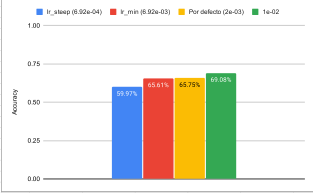
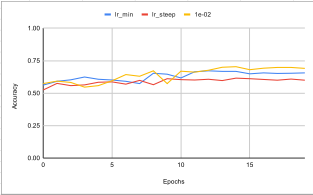
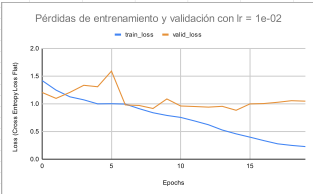
Pérdidas de entrenamiento y validación con lr_min

Epochs	train_loss	valid_loss
0	1.4	1.1
1	1.2	1.1
2	1.1	1.1
3	1.0	1.2
4	0.9	1.3
5	0.8	1.0
6	0.7	1.0
7	0.6	3.8
8	0.5	0.9
9	0.4	0.9
10	0.3	1.0
11	0.2	0.9
12	0.1	1.0
13	0.1	1.1
14	0.1	1.0
15	0.1	1.1
16	0.1	1.1
17	0.1	1.1
18	0.1	1.1

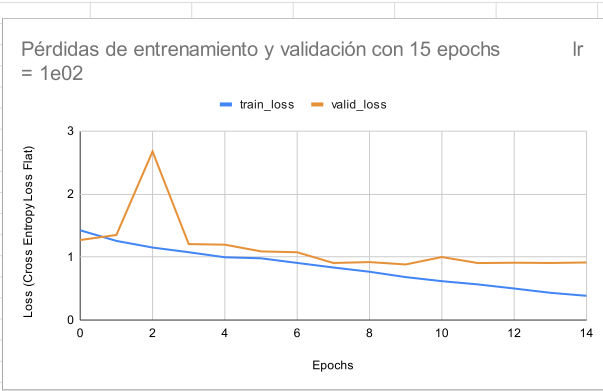
epoch	train_loss	valid_loss	accuracy	time
0	2.888076067	0.23		
1	4.234762669	0.23		
epoch	train_loss	valid_loss	accuracy	time
0	2.343491793	1.629983664	0.4956647456	0:26
epoch	train_loss	valid_loss	accuracy	time
0	1.831425428	1.503712893	0.5245664716	0:33
1	1.69944334	1.379862666	0.5751445293	0:34
2	1.614515424	1.373356581	0.557803452	0:34
3	1.508633733	1.388421535	0.5635837913	0:34
4	1.403722048	1.414355516	0.5838150382	0:34
5	1.297280788	1.301085114	0.5867052078	0:34
6	1.205116153	1.260372281	0.5693641901	0:34
7	1.082875371	1.28612411	0.5982658863	0:34
8	0.9872552752	1.308238149	0.5650289059	0:35
9	0.8846380115	1.22189784	0.6112716794	0:35
10	0.7897306681	1.301872849	0.6040462255	0:35
11	0.7187271118	1.346838951	0.6011560559	0:35
12	0.6593014598	1.32128644	0.6069363952	0:35
13	0.580517292	1.350087523	0.5968208313	0:35
14	0.510884881	1.39042747	0.6156069636	0:35
15	0.4771855772	1.386850834	0.6112716794	0:35
16	0.4253008366	1.390700459	0.6054913402	0:35
17	0.3720983863	1.412798882	0.5997110009	0:35
18	0.3688110113	1.410796046	0.6083815098	0:35
19	0.3525395691	1.412708879	0.5997110009	0:35



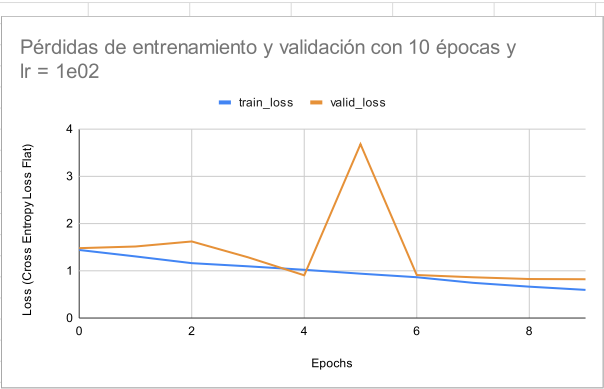
epoch	train_loss	valid_loss	accuracy	time
0	2.888076097	0.22		
1	4.234760969	0.22		
epoch	train_loss	valid_loss	accuracy	time
0	2.147006273	1.746699997	0.4985549152	0.25
epoch	train_loss	valid_loss	accuracy	time
0	1.418263422	1.203254104	0.5736994147	0.33
1	1.246457815	1.097367644	0.5304850471	0.34
2	1.155902332	1.056976274	0.5623690386	0.34
3	1.071207047	1.333655634	0.5462427735	0.34
4	0.998721242	1.307405472	0.557803452	0.34
5	1.051465586	1.589636683	0.5953717187	0.34
6	0.9949459434	0.9800142648	0.6430636048	0.35
7	0.9116943479	0.9630257967	0.6306578117	0.35
8	0.8581741461	0.9160229179	0.671960391	0.35
9	0.7896121144	1.087210894	0.5736994147	0.35
10	0.7538963556	0.9588810077	0.690751314	0.35
11	0.6861548252	0.9507218951	0.6618407372	0.35
12	0.6216000915	0.9396134615	0.6763005853	0.35
13	0.5265133381	0.9540199041	0.6994219622	0.35
14	0.4676004593	0.9827131687	0.7037572266	0.35
15	0.3976564109	0.997877717	0.6806358099	0.35
16	0.3352061212	1.00410533	0.692196548	0.35
17	0.2772653103	1.02655943	0.6979768872	0.35
18	0.2488686442	1.055746317	0.6979768872	0.35
19	0.2272495776	1.047097325	0.6907514334	0.35



epoch	train_loss	valid_loss	accuracy	time
0	2.888076067	0.22		
1	4.234762669	0.22		
epoch	train_loss	valid_loss	accuracy	time
0	2.147006273	1.749695897	0.4985549152	0:25
epoch	train_loss	valid_loss	accuracy	time
0	1.422874808	1.268870831	0.5361271501	0:33
1	1.255152822	1.349294543	0.5549132824	0:34
2	1.149508476	2.674137354	0.5361271501	0:34
3	1.075481057	1.204286337	0.5534682274	0:34
4	0.9951288104	1.194985867	0.6040462255	0:34
5	0.9786179662	1.088573456	0.6676300764	0:34
6	0.9053708911	1.074857473	0.6517341137	0:34
7	0.8329601884	0.9047461748	0.6575144529	0:34
8	0.7654953003	0.918844521	0.6849710941	0:35
9	0.6805946231	0.8812143803	0.7095375657	0:35
10	0.6159468889	0.9988767505	0.6416184902	0:35
11	0.5644616485	0.9032694101	0.6849710941	0:35
12	0.499617219	0.9089691639	0.6979768872	0:35
13	0.4318217337	0.9049333334	0.6979768872	0:35
14	0.3837095797	0.9125676751	0.692196548	0:35

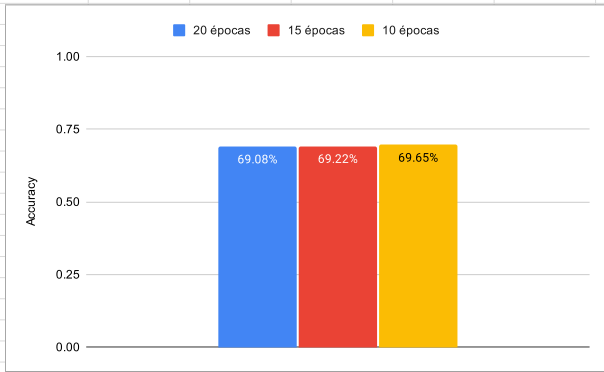
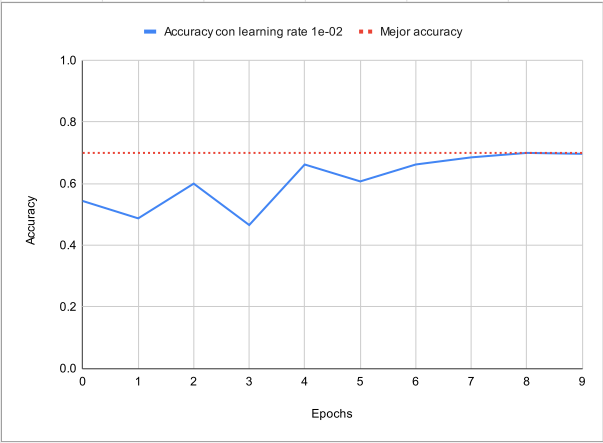
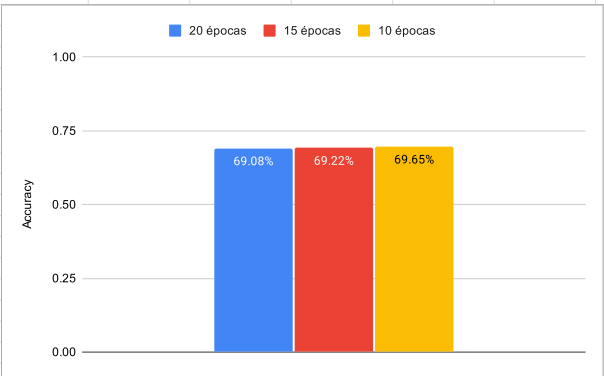


epoch	train_loss	valid_loss	accuracy	time
0	2.888076067	0.22		
1	4.234762669	0.22		
epoch	train_loss	valid_loss	accuracy	time
0	2.147006273	1.749695897	0.4985549152	0:25
epoch	train_loss	valid_loss	accuracy	time
0	1.438815713	1.477332711	0.5433526039	0:33
1	1.302480221	1.512382388	0.4869942069	0:34
2	1.15999043	1.619021058	0.5997110009	0:34
3	1.09324193	1.283913612	0.4653179049	0:34
4	1.019610643	0.9033285379	0.6618497372	0:34
5	0.9375157356	3.677213907	0.6069363952	0:34
6	0.8622804284	0.909027338	0.6618497372	0:34
7	0.7439149022	0.8611978292	0.6849710941	0:35
8	0.6626556516	0.8243257403	0.6994219422	0:35
9	0.5944790244	0.8196963072	0.6965317726	0:35



Confusion matrix

Actual \ Predicted	DISK	DISKIRR	DISKSPH	IRR	NONE	SPH
DISK	114	17	33	2	2	2
DISKIRR	28	29	1	2	0	2
DISKSPH	17	1	135	0	1	27
IRR	5	12	2	8	2	1
NONE	9	4	4	1	6	8
SPH	0	0	23	0	4	190



epoch	train_loss	valid_loss	_rmse	mae	morph_accuracy	time
0	1.443741202	0.5686129332	0.5753352046	0.4192245603	0.1806358382	9:08
epoch	train_loss	valid_loss	_rmse	mae	morph_accuracy	time
0	0.5169790983	0.4578026235	0.5170796514	0.2075035721	0.3294797688	0:32
1	0.4509887099	0.3364567757	0.3717280626	0.1746876836	0.289017341	0:33
2	0.3876064718	0.253079921	0.2614254355	0.1430527419	0.4898843931	0:34
3	0.3516456187	0.3192810416	0.3424099088	0.154722631	0.4046242775	0:34
4	0.3456821442	0.2439213842	0.2472089976	0.1596824974	0.3540462428	0:34
5	0.366813004	0.6443268061	0.789599061	0.1980285645	0.3121387283	0:34
6	0.3832185864	0.6500667334	0.7873151302	0.3742776811	0.2023121387	0:34
7	0.4027997255	0.3373490274	0.3382920921	0.2264428288	0.2080924855	0:34
8	0.3928228021	1.397798896	1.407091141	1.126022339	0.3193641618	0:34
9	0.3696171939	0.2694097459	0.274723798	0.1861147732	0.5	0:34
10	0.3558033407	0.1949658096	0.198075071	0.1223307624	0.5549132948	0:34
11	0.3425390422	0.2509890199	0.2553724945	0.1589553207	0.2543352601	0:34
12	0.3249279261	0.3332428336	0.3357583284	0.1760925055	0.3540462428	0:34
13	0.3209132552	0.5306549668	0.5598319769	0.2167389244	0.5158959538	0:34
14	0.3193285763	0.410892725	0.4212431908	0.2034694105	0.387283237	0:34
15	0.3230282366	0.3588989377	0.3695075512	0.1795012355	0.598265896	0:34
16	0.2995390296	0.7489178777	0.7490964532	0.5925171375	0.04479768786	0:34
17	0.2550292611	0.1978815794	0.1984566003	0.1278706789	0.4132947977	0:34
18	0.210964635	0.1515206248	0.1523667723	0.09898588061	0.5014450867	0:34
19	0.1820967048	0.1384293735	0.1389677823	0.09233394265	0.6286127168	0:34
20	0.1619199365	0.1339994669	0.1346554607	0.08589736372	0.6560693642	0:34
21	0.1499072611	0.1291260868	0.1297018975	0.08268937469	0.6430635838	0:34
22	0.1439325511	0.129665643	0.1307221949	0.08301284164	0.6705202312	0:34
23	0.1385703385	0.1273098141	0.1280587316	0.08385824412	0.6604046243	0:34
24	0.1342557371	0.1219019443	0.1225811988	0.07781561464	0.6820809249	0:34
25	0.1267957836	0.1276581138	0.1287495941	0.07731097192	0.6806358382	0:34
26	0.1246339157	0.1175583452	0.1182363331	0.07175657153	0.6994219653	0:34
27	0.1228753775	0.1145078987	0.115491353	0.06927379966	0.6979768786	0:34
28	0.1199324876	0.1144816875	0.1152880639	0.06875160336	0.7239884393	0:34
29	0.1181870028	0.1159638613	0.1168596372	0.07028843462	0.7153179191	0:34

