

Galaxy Classification with Deep Convolutional Neural Networks

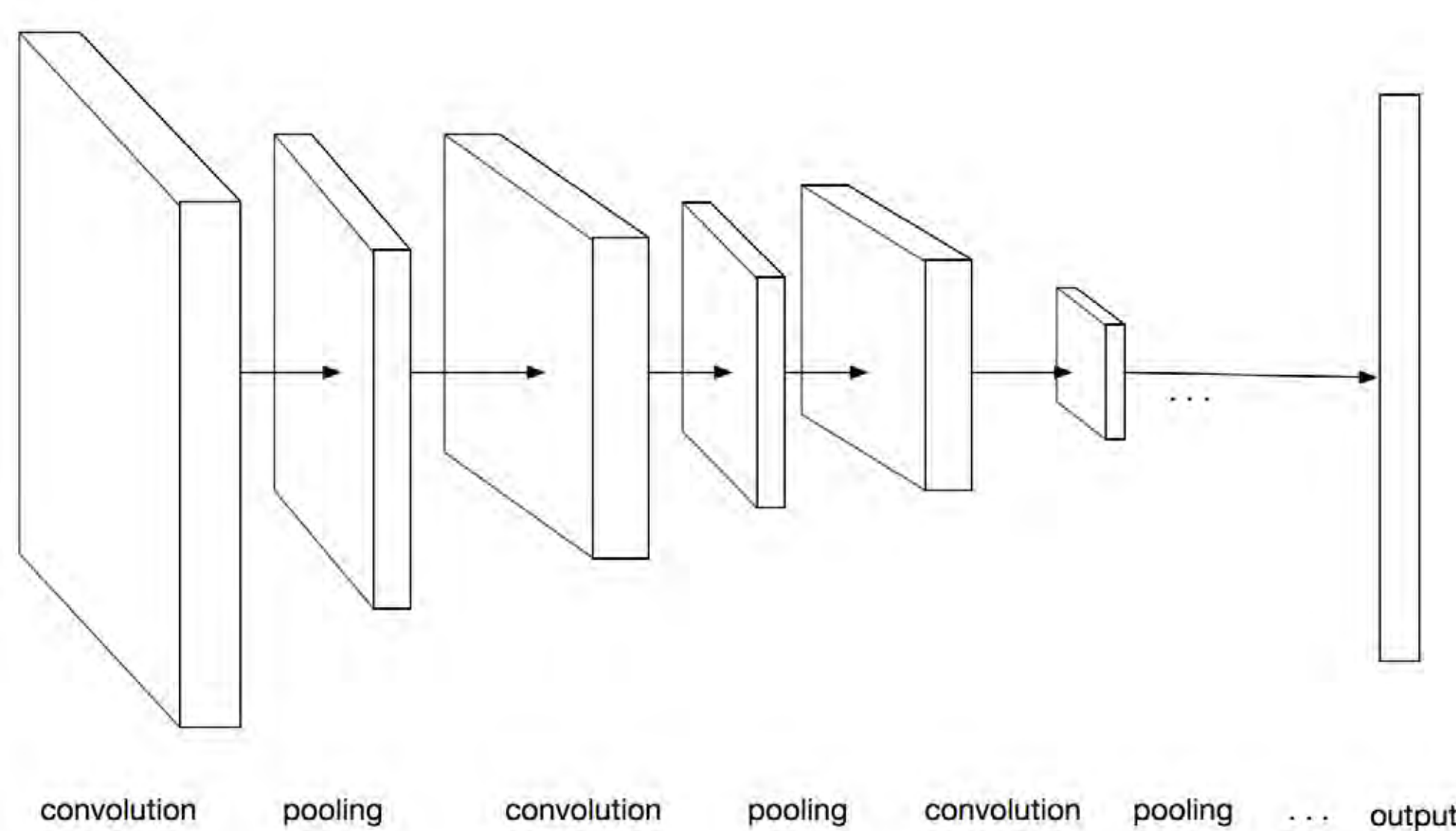


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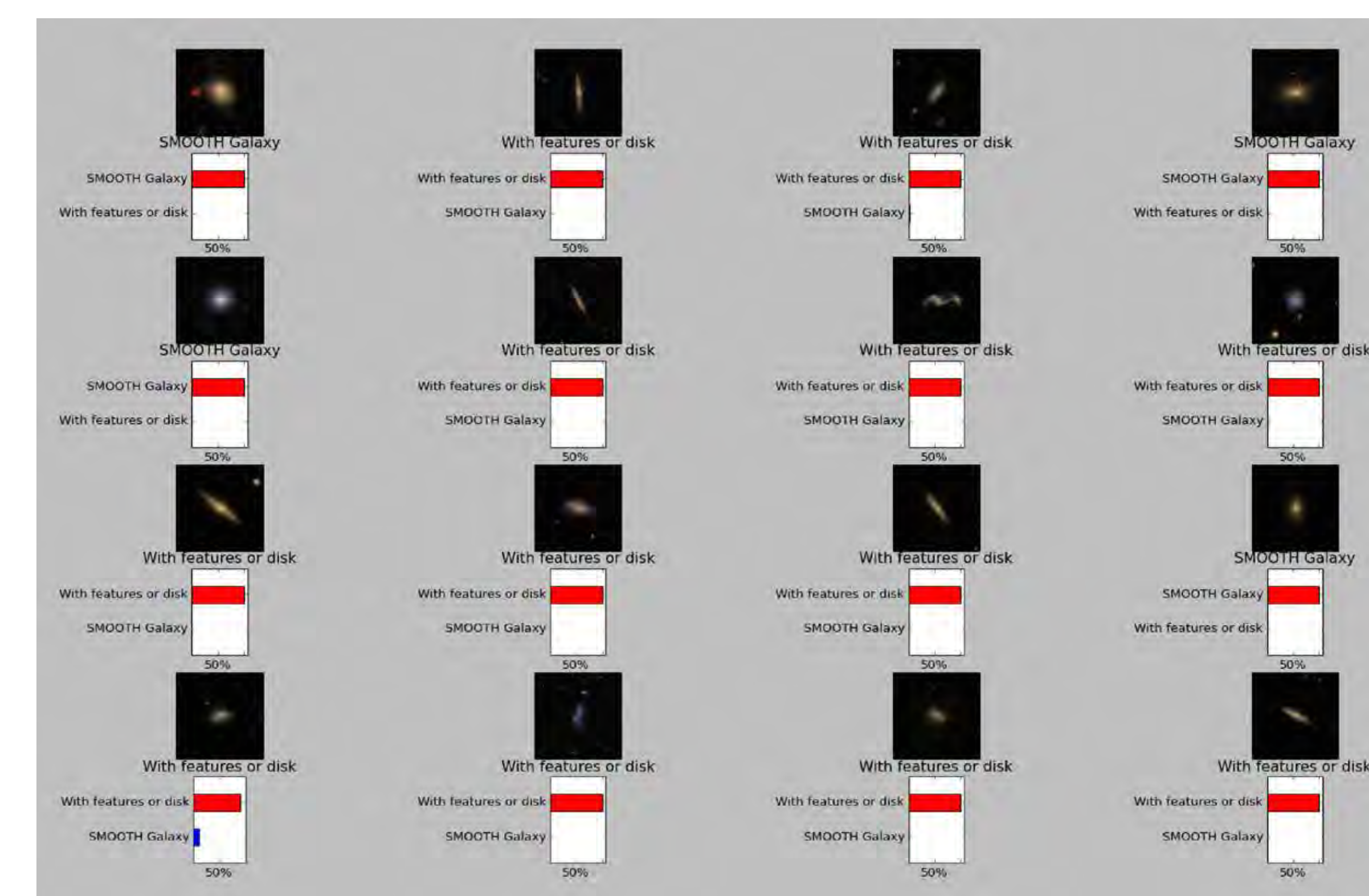
Galaxy Data



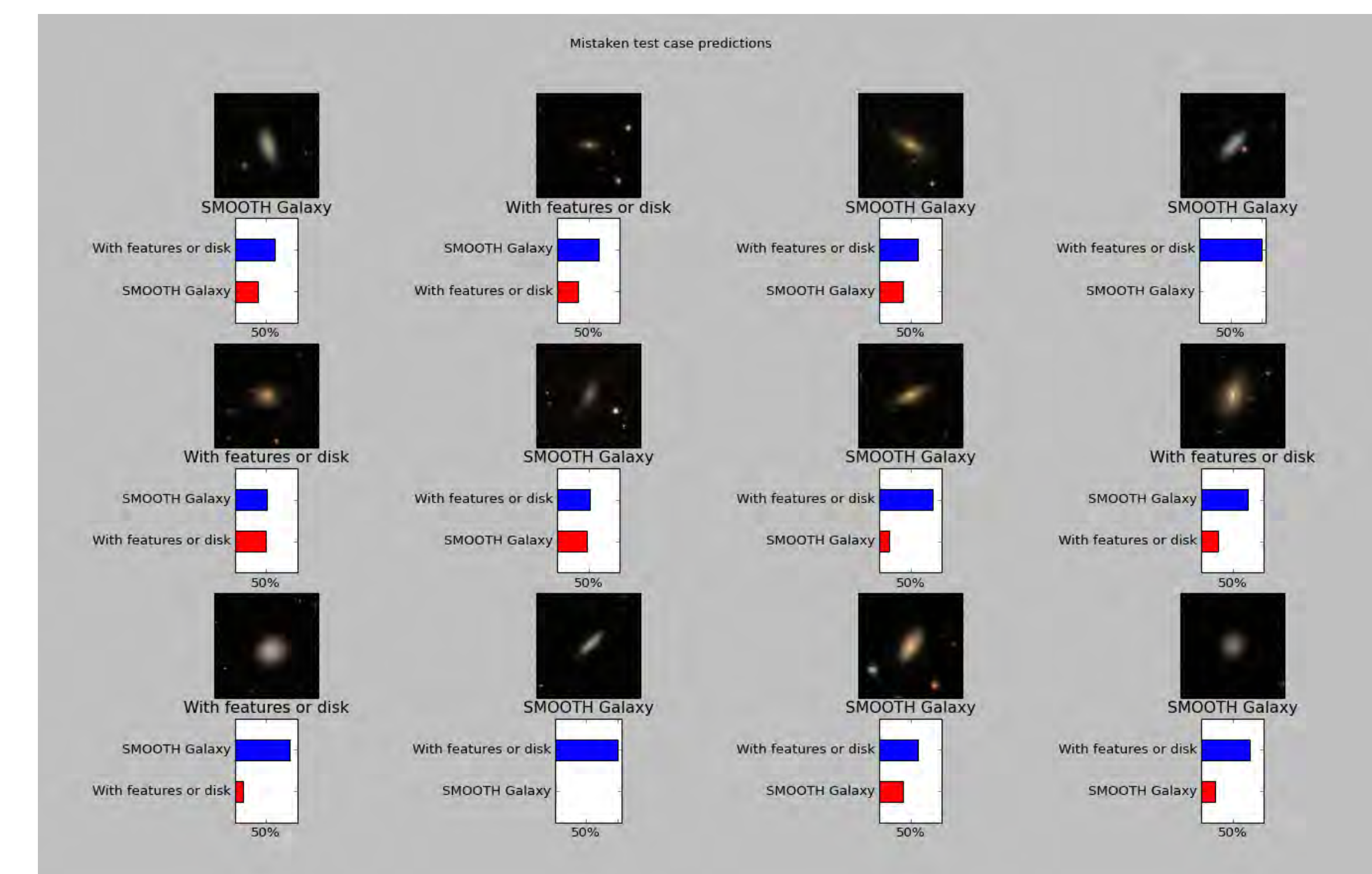
Training with Deep CNN



Good Results



Not-so-good Results ?



Just Intelligent like Human?

TEST P	TEST with learning from [0.5,1.0] 0.163	TEST with learning from [0.8,1.0], 0.023	TEST with learning from [0.5,0.6] 0.405	TEST with learning from [0.9,1.0] 0.024
0.5-0.6	0.40	0.39	0.415	0.410
0.6-0.7	0.25	0.20	0.290	0.261
0.7-0.8	0.13	0.10	0.180	0.136
0.8-0.9	0.06	0.025	0.122	0.060
0.9-1.0	0.03	0.008	0.090	0.012

GalaxyID	Class1	Class2	Class3	Class2.1	Class2.2	Class3.1	Class3.2	Class4.1	Class4.2	Class5.1	Class5.2	Class5.3	Class5.4	Class6.1	Class6.2	Class7.1
100008	0.383147	0.616853	0	0	0	0.03845215	0.96154785	0.41839782	0.58160218	0	0.10475213	0.89524787	0	0.054453	0.945547	0.054453
100023	0.327003	0.672997	0.000222	0.00111927	0.82020973	0.17879027	0.82120973	0.17879027	0.82120973	0	0.17879027	0.82120973	0	0.17879027	0.82120973	0
100053	0.693377	0.306623	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100078	0.693377	0.306623	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100090	0.953839	0.046161	0	0	0	0	0	0	0	0	0	0	0	0.029383	0.970617	0.029383
100122	0.738832	0.261168	0.002309	0	0.238159	0	0.238159	0	0.238159	0	0.238159	0	0.238159	0	0.761841	0.238159
100123	0.662492	0.337508	0.001475	0	0.660333	0	0.339667	0	0.660333	0	0.339667	0	0.660333	0	0.339667	0.660333
100128	0.687783	0.312217	0.001873	0	0.288344	0.6909818	0.3090182	0	0.288344	0.6909818	0.3090182	0	0.288344	0.6909818	0.3090182	0
100134	0.021834	0.978166	0.001214	0.02175086	0.95520114	0.31307673	0.64212442	0.54649003	0.40871051	0.16009549	0.7600878	0.03441685	0	0.511499	0.388501	0.010917
100143	0.208443	0.791557	0	0	0	0	0	0	0	0	0	0	0	0.430523	0.569477	0
100150	0.429378	0.570622	0	0.324901	0	0.524901	0	0.524901	0	0.524901	0	0.524901	0	0.475099	0.524901	0.475099
100157	0.330462	0.669538	3.93E-04	0	0.669545	0.330462	0.669538	0.330462	0.669538	0.330462	0.669538	0.330462	0.669538	0.330462	0.669538	0.330462
100187	0.448221	0.551779	0	0.551779	0.448221	0.551779	0.448221	0.551779	0.448221	0.551779	0.448221	0.551779	0.448221	0.551779	0.448221	0.551779
100204	0.467625	0.532375	0	0.53148	0.467625	0.532375	0.467625	0.532375	0.467625	0.532375	0.467625	0.532375	0.467625	0.532375	0.467625	0.532375
100217	0.164393	0.835607	0.004805	0.03079479	0.79960521	0.164393	0.835607	0.004805	0.03079479	0.79960521	0.164393	0.835607	0.004805	0.03079479	0.79960521	0.164393
100239	0.338597	0.661403	0	0.661403	0.338597	0.661403	0.338597	0.661403	0.338597	0.661403	0.338597	0.661403	0.338597	0.661403	0.338597	0.661403
100263	0.179654	0.820346	0.001816	0.57779117	0.24473883	0.47725654	0.52274346	0.1974132	0.80258678	0.22811593	0.07109761	0.06740719	0.10623379	0.893055	0.106945	0.086045
100284	0.451518	0.548482	0	0.308559	0	0.308559	0	0.308559	0	0.308559	0	0.308559	0	0.691441	0.308559	0.691441
100295	0.742621	0.257379	0	0.257379	0.742621	0.257379	0.742621	0.257379	0.742621	0.257379	0.742621	0.257379	0.742621	0.257379	0.742621	0.257379
100322	0.081087	0.918913	0	0.16180582	0.83819418	0.16180582	0.83819418	0.16180582	0.83819418	0.16180582	0.83819418	0.16180582	0.83819418	0.16180582	0.83819418	0.16180582
100335	0.165002	0.834998	0	0.23532488	0.59967512	0.165002	0.834998	0.59967512	0.23532488	0.165002	0.834998	0.59967512	0.23532488	0.165002	0.834998	0.59967512
100367	0.471429	0.528571	0.015863	0.02866192	0.48044009	0.21702061	0.26702548	0.26579648	0.2182496	0.12830271	0.12180955	0.15821163	0.7773312	0.43028	0.56942	0.0263378
100380	0.0	1.0	0.97	0.029305	0.970695	0.483175	0.516825	0.516825	0.483175	0.516825	0.483175	0.516825	0.483175	0.516825	0.483175	0.516825
100382	0.256861	0.743139	0	0.743139	0.256861	0.743139	0.256861	0.743139	0.256861	0.743139	0.256861	0.743139	0.256861	0.743139	0.256861	0.743139
100383	0.3051	0.6949	0.012979	0.03613121	0.64586879	0.37765647	0.26793353	0.44302217	0.20198761	0	0.03051123	0.45047577	0.16458279	0.330713	0.669287	0.18290961

Galaxy Classes

