

UPDATED ANALYSIS ON 2D CNN ARCHITECTURE MODEL ON BRAIN TUMOR CLASSIFICATION

1) Activation Function ReLu:

Kernel Size	3x3
No. Of Kernels	1st Layer: 32 Kernels 2nd Layer: 64 Kernels 3rd Layer: 128 Kernels
Activation Function	ReLu
Dropout Layers	No Dropout Layers
FCs Layer	1 Fully Connect Layers Dense (128, activation = ReLU)
Regularization	No regularization
Max Pooling	First Max Pooling: (2x2) Second Max Pooling: (2x2) Third Max Pooling: (2x2)
No. of Control Layers	No Specific Control Layers

- Result and Observation:

Epoch	Training Accuracy	Training Loss	Validation Accuracy	Validation Loss
1	0.4225	1.3662	0.6112	1.0262
2	0.6775	0.8042	0.7070	0.7986
3	0.7149	0.7031	0.6889	0.7984
4	0.7377	0.6444	0.6426	1.0037
5	0.7562	0.6068	0.6905	0.8054
6	0.7720	0.5701	0.7408	0.6797
7	0.7719	0.5706	0.7172	0.7343
8	0.8057	0.4955	0.7926	0.5415
9	0.7951	0.5069	0.7863	0.5387
10	0.8153	0.4807	0.8115	0.4872
11	0.8238	0.4384	0.8146	0.4930
12	0.8254	0.4424	0.7636	0.6087
13	0.8325	0.4185	0.8335	0.4375
14	0.8465	0.4092	0.7510	0.6673
15	0.8561	0.3853	0.8060	0.5424
16	0.8477	0.3920	0.8421	0.4248
17	0.8565	0.3835	0.8358	0.4533
18	0.8680	0.3441	0.8335	0.4332

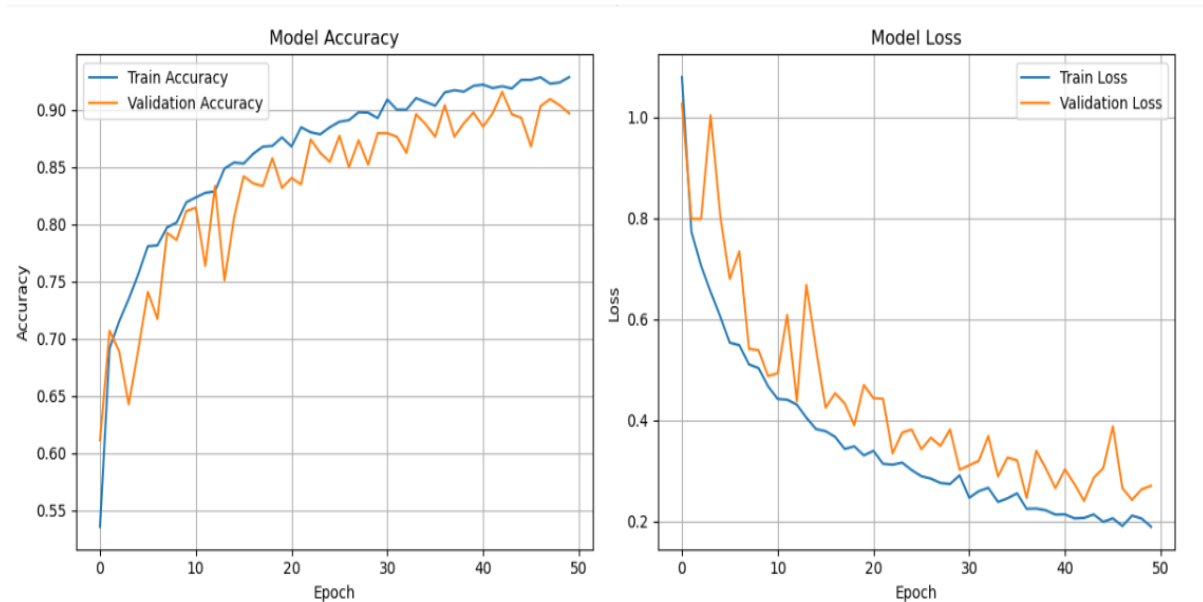
Epoch	Training Accuracy	Training Loss	Validation Accuracy	Validation Loss
19	0.8754	0.3395	0.8578	0.3902
20	0.8800	0.3241	0.8319	0.4698
21	0.8703	0.3260	0.8405	0.4436
22	0.8796	0.3247	0.8350	0.4424
23	0.8868	0.3045	0.8743	0.3341
24	0.8760	0.3239	0.8625	0.3754
25	0.8906	0.2958	0.8547	0.3815
26	0.8827	0.2967	0.8775	0.3425
27	0.8936	0.2792	0.8500	0.3653
28	0.8917	0.2967	0.8735	0.3492
29	0.9019	0.2669	0.8523	0.3816
30	0.8974	0.2810	0.8798	0.3021
31	0.9139	0.2275	0.8798	0.3108
32	0.8999	0.2506	0.8767	0.3195
33	0.8976	0.2703	0.8625	0.3687
34	0.9082	0.2552	0.8963	0.2886
35	0.9044	0.2461	0.8877	0.3259
36	0.8982	0.2629	0.8767	0.3205
37	0.9072	0.2346	0.9042	0.2462

Epoch	Training Accuracy	Training Loss	Validation Accuracy	Validation Loss
38	0.9111	0.2333	0.8767	0.3396
39	0.9147	0.2329	0.8885	0.3044
40	0.9225	0.2071	0.8979	0.2655
41	0.9239	0.2042	0.8853	0.3029
42	0.9222	0.2098	0.8971	0.2731
43	0.9255	0.1962	0.9159	0.2400
44	0.9149	0.2280	0.8963	0.2859
45	0.9314	0.1852	0.8932	0.3050
46	0.9250	0.2039	0.8680	0.3879
47	0.9310	0.1891	0.9034	0.2654
48	0.9224	0.2107	0.9097	0.2420
49	0.9302	0.1820	0.9011	0.2966
50	0.9308	0.1764	0.9113	0.2784

Test Accuracy: 0.9159

Test Loss: 0.2400

- Graph:



2) Activation Function Sigmoid:

Kernel Size	3x3
No. Of Kernels	1st Layer: 32 Kernels 2nd Layer: 64 Kernels 3rd Layer: 128 Kernels
Activation Function	Sigmoid
Dropout Layers	No Dropout Layers
FCs Layer	1 Fully Connect Layers Dense (128, activation = ReLU)
Regularization	No regularization
Max Pooling	First Max Pooling: (2x2) Second Max Pooling: (2x2) Third Max Pooling: (2x2)
No. of Control Layers	No Specific Control Layers

- Result and Observation:

Epoch	Training Accuracy	Training Loss	Validation Accuracy	Validation Loss
1	0.2812	1.3977	0.6826	0.8114
2	0.6838	0.7801	0.6858	0.7955
3	0.7228	0.6972	0.7628	0.6026
4	0.7499	0.6197	0.7211	0.7256
5	0.7611	0.5833	0.7573	0.6239
6	0.7808	0.5466	0.7659	0.6175
7	0.8134	0.4933	0.7062	0.7591
8	0.8057	0.4862	0.7753	0.5646
9	0.8262	0.4605	0.8130	0.4775
10	0.8068	0.4750	0.8020	0.4789
11	0.8412	0.3994	0.8170	0.4445
12	0.8289	0.4206	0.8201	0.4327
13	0.8527	0.3840	0.8107	0.4479
14	0.8454	0.3906	0.8052	0.4751
15	0.8574	0.3612	0.8350	0.3939
16	0.8683	0.3479	0.8099	0.4821
17	0.8638	0.3576	0.8476	0.3724
18	0.8770	0.3386	0.8013	0.5104

Epoch	Training Accuracy	Training Loss	Validation Accuracy	Validation Loss
19	0.8622	0.3397	0.8523	0.3745
20	0.8701	0.3163	0.8335	0.3959
21	0.8752	0.3276	0.8515	0.3808
22	0.8729	0.3282	0.8437	0.3945
23	0.8769	0.3296	0.8295	0.4259
24	0.8898	0.2830	0.8295	0.4224
25	0.8868	0.2880	0.8720	0.3247
26	0.8917	0.2857	0.8539	0.3533
27	0.9056	0.2574	0.8657	0.3258
28	0.8967	0.2777	0.8720	0.3135
29	0.8958	0.2679	0.8602	0.3532
30	0.9029	0.2372	0.8908	0.2691
31	0.9100	0.2355	0.8641	0.3341
32	0.9081	0.2537	0.8704	0.3224
33	0.9093	0.2376	0.8947	0.2844
34	0.9152	0.2200	0.8822	0.3207
35	0.9137	0.2378	0.8814	0.3000
36	0.9195	0.2118	0.8837	0.2761
37	0.9213	0.2131	0.8932	0.2693

Epoch	Training Accuracy	Training Loss	Validation Accuracy	Validation Loss
38	0.9152	0.2117	0.9042	0.2485
39	0.9155	0.2218	0.9175	0.2109
40	0.9260	0.2038	0.9018	0.2486
41	0.9226	0.2021	0.9183	0.2026
42	0.9370	0.1816	0.9049	0.2449
43	0.9225	0.1954	0.9112	0.2185
44	0.9308	0.1860	0.9112	0.2155
45	0.9327	0.1818	0.9144	0.2100
46	0.9408	0.1595	0.8413	0.4423
47	0.9310	0.1895	0.9230	0.1940
48	0.9283	0.1834	0.9293	0.1792
49	0.9450	0.1524	0.9073	0.2441
50	0.9384	0.1675	0.9379	0.1733

Test Accuracy: 0.9379

Test Loss: 0.1733

- Graph:

