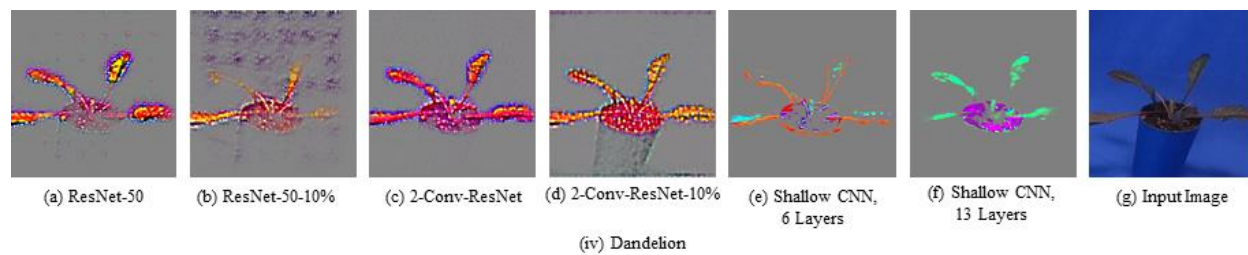
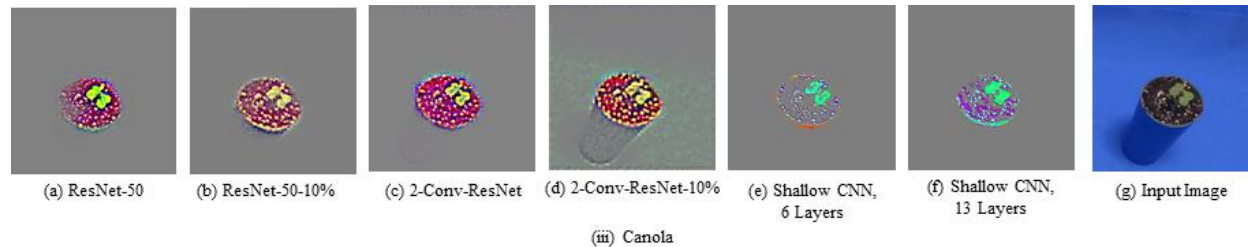
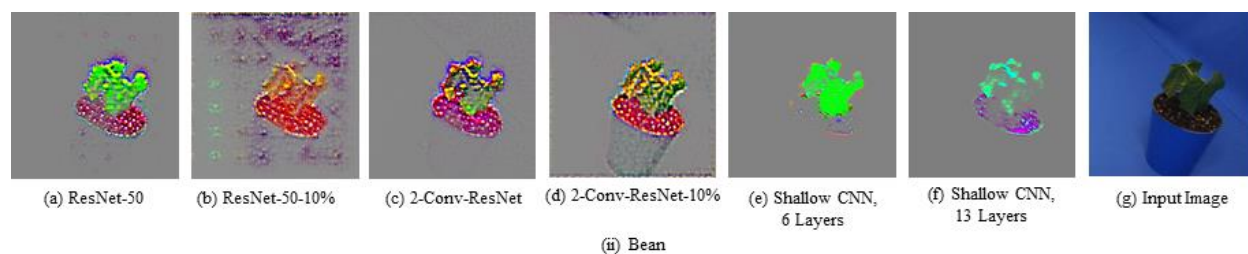
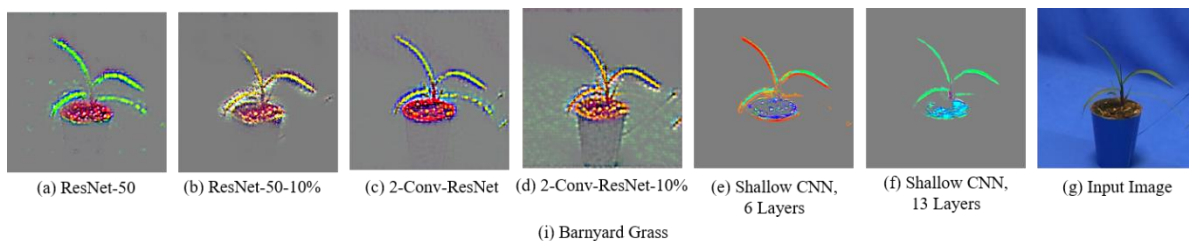


Visualizing Feature Maps for Model Selection in Convolutional Neural Networks

Supplementary Materials



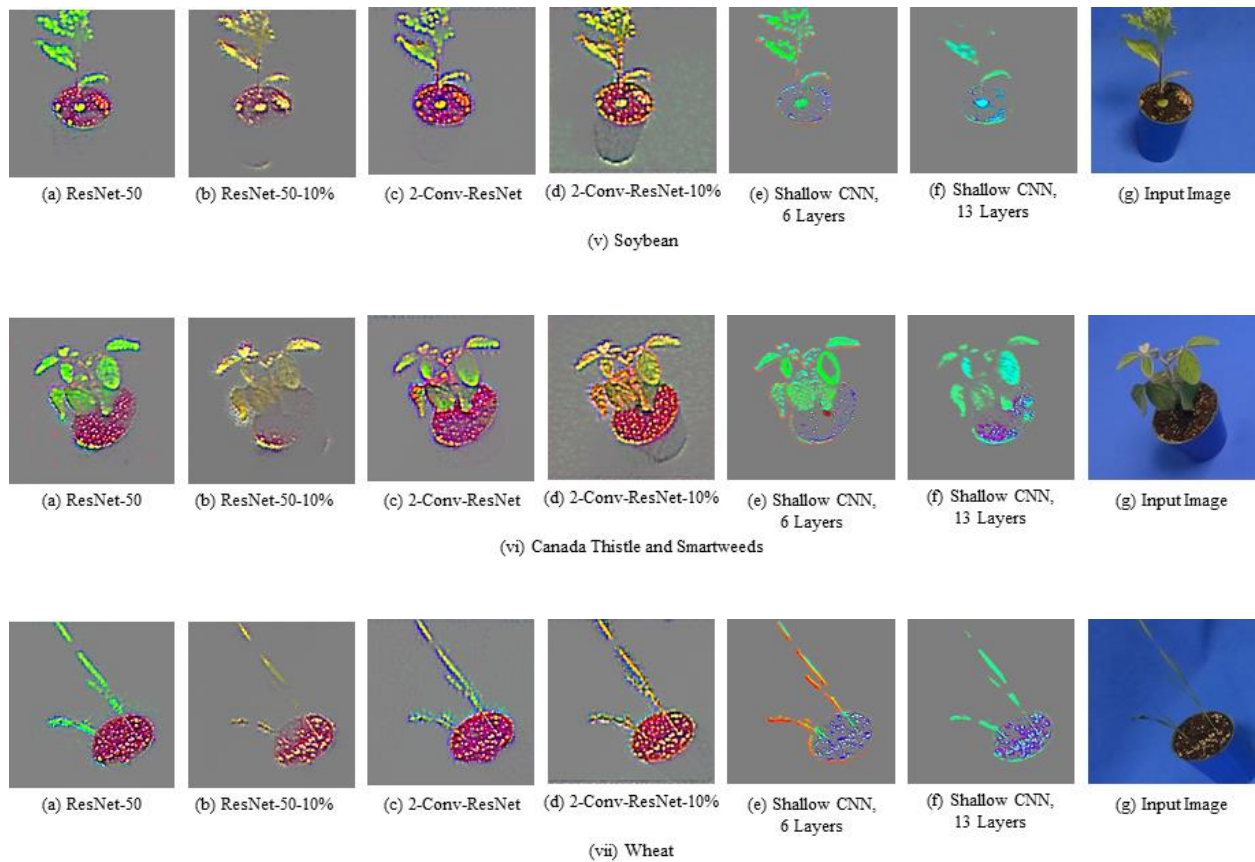
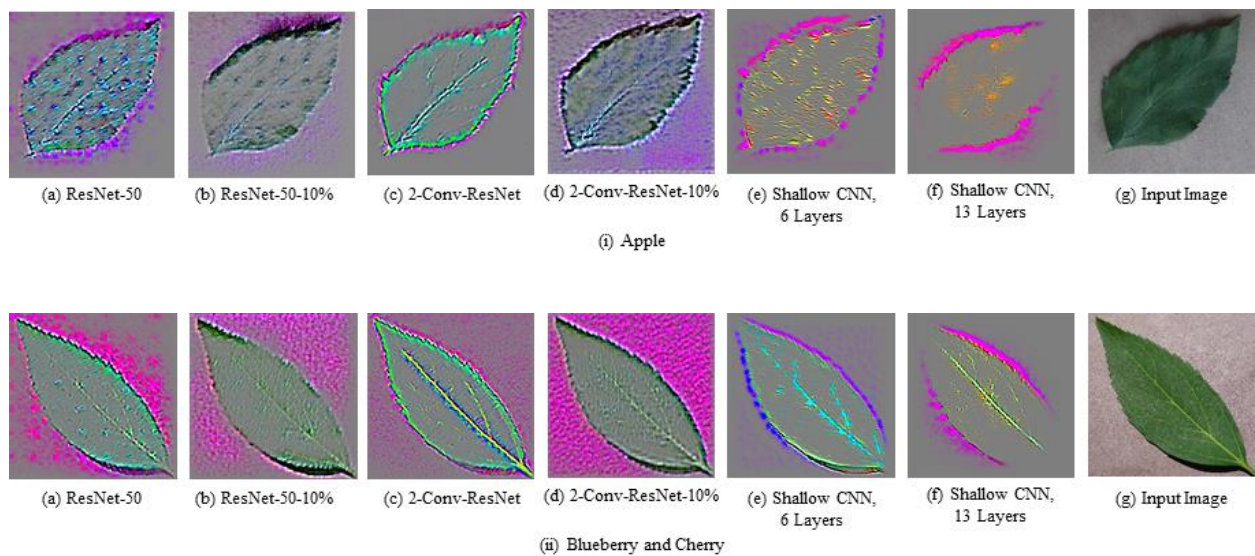
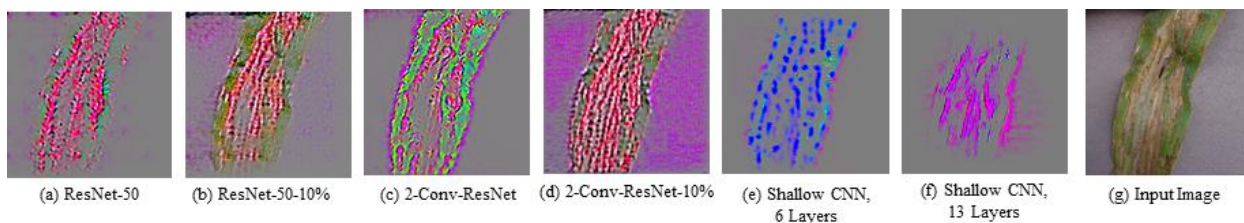
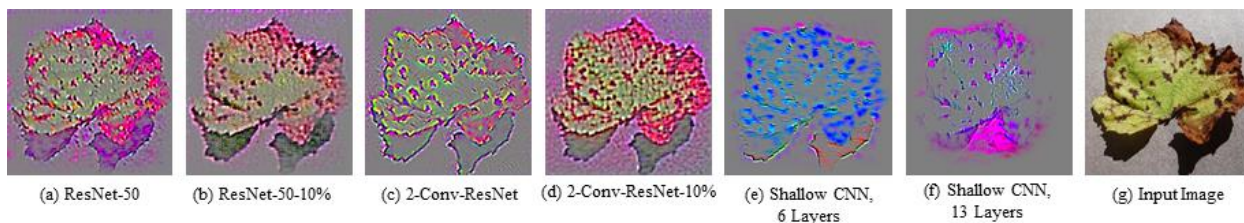


Figure 1: GBP visualization of the last convolutional layer of different CNN models for different classes of the Weedling dataset.

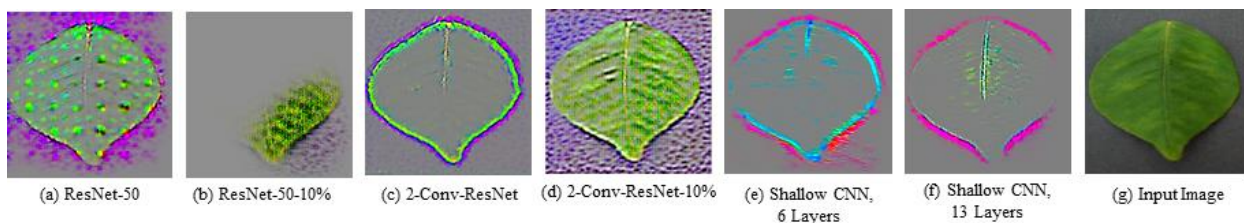




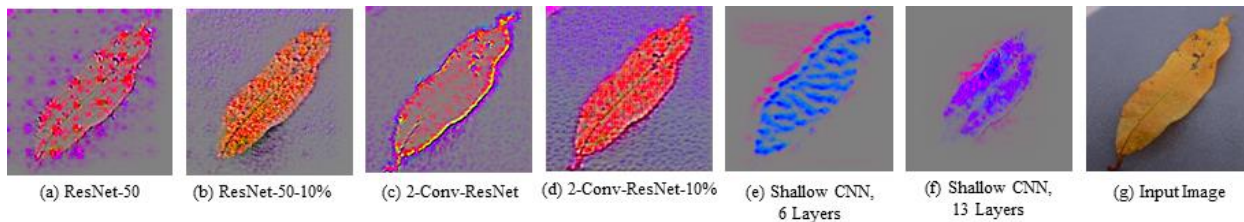
(iii) Corn



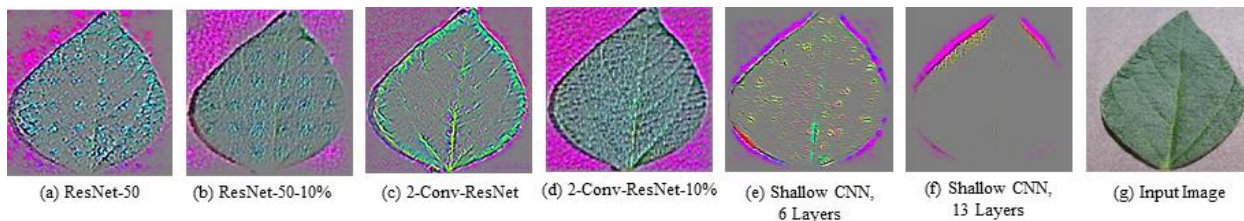
(iv) Grape



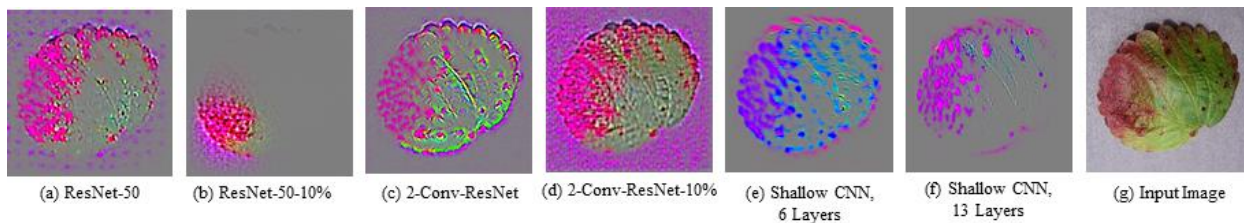
(v) Orange



(vi) Peach and Pepper



(vii) Soybean



(viii) Strawberry and Squash

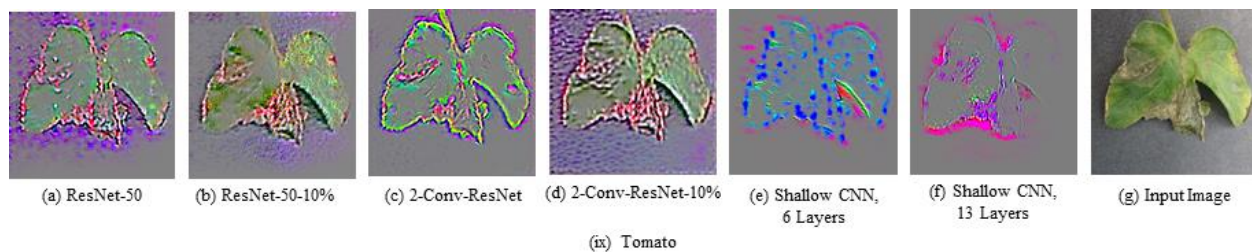
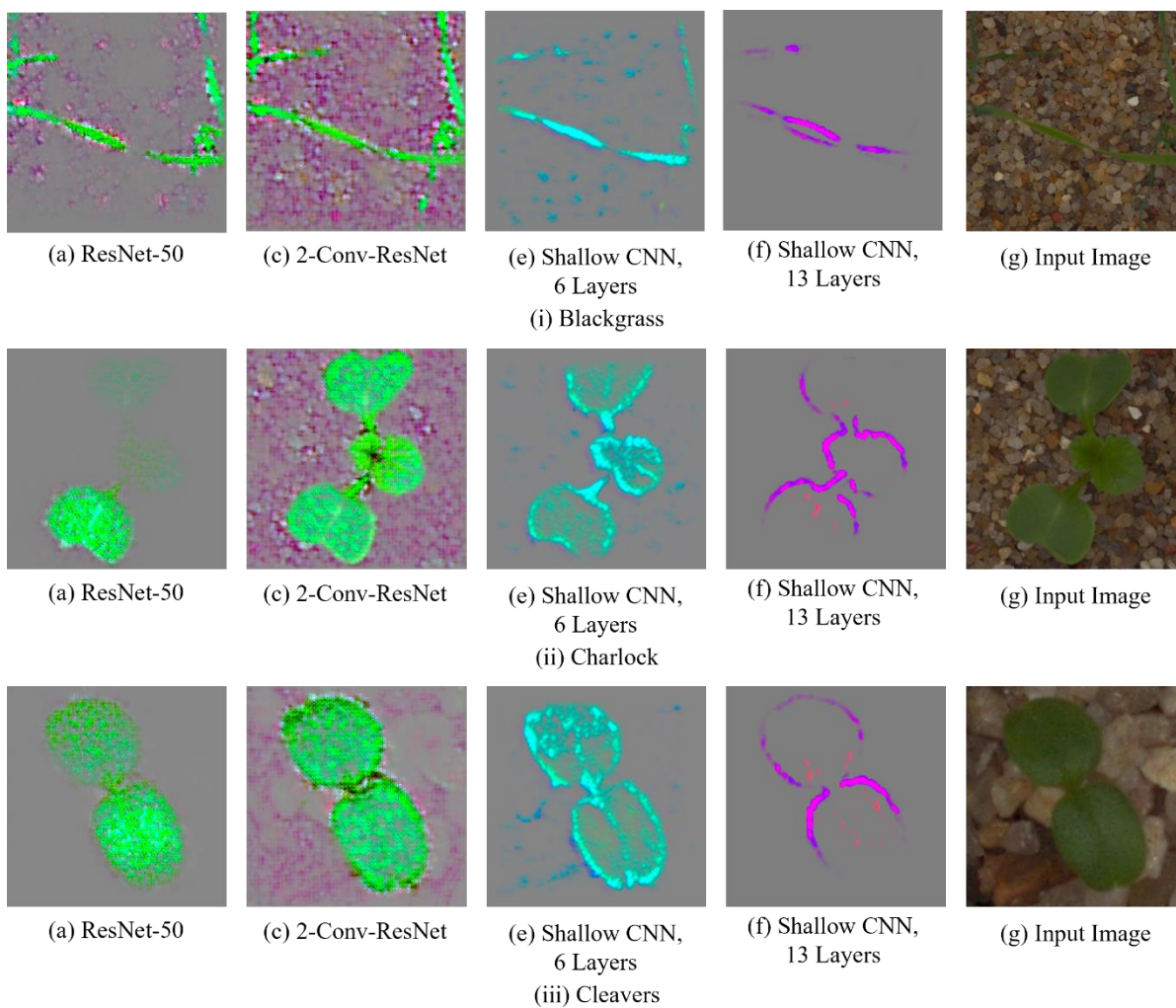
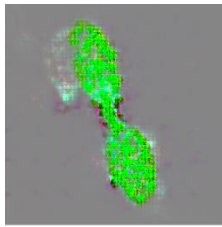
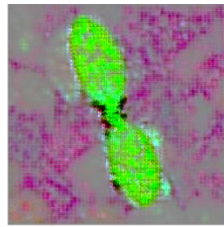


Figure 2: GBP visualization of the last convolutional layer of different CNN models for different classes of the Plant Village dataset.

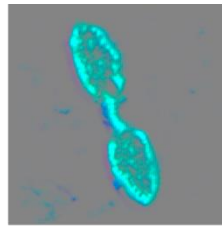




(a) ResNet-50



(c) 2-Conv-ResNet



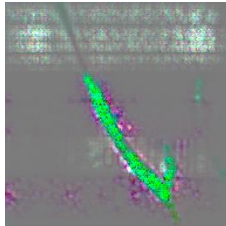
(e) Shallow CNN,
6 Layers
(iv) Chickweed



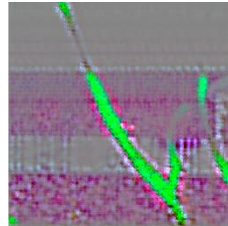
(f) Shallow CNN,
13 Layers



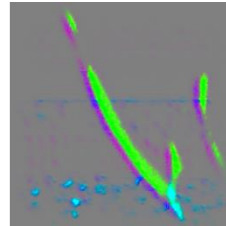
(g) Input Image



(a) ResNet-50



(c) 2-Conv-ResNet



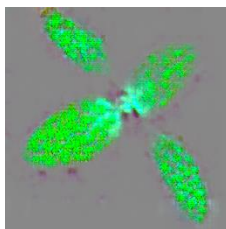
(e) Shallow CNN,
6 Layers
(v) Wheat



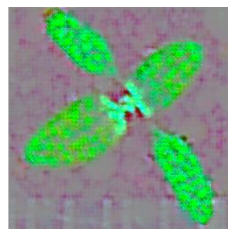
(f) Shallow CNN,
13 Layers



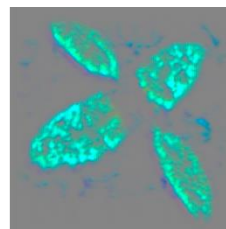
(g) Input Image



(a) ResNet-50



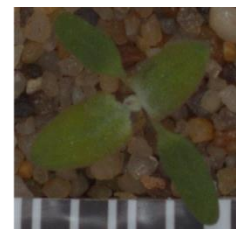
(c) 2-Conv-ResNet



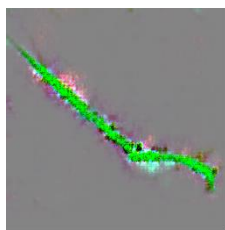
(e) Shallow CNN,
6 Layers
(vi) Fat hen



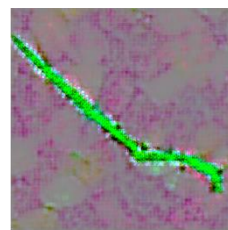
(f) Shallow CNN,
13 Layers



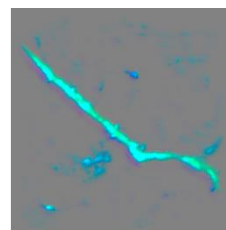
(g) Input Image



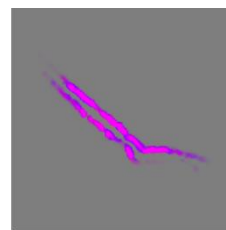
(a) ResNet-50



(c) 2-Conv-ResNet



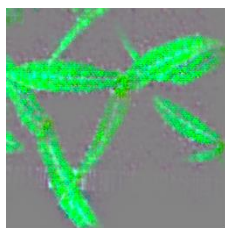
(e) Shallow CNN,
6 Layers
(vii) Loose silky-bent



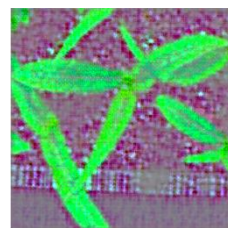
(f) Shallow CNN,
13 Layers



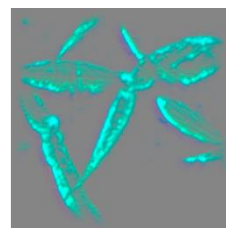
(g) Input Image



(a) ResNet-50



(c) 2-Conv-ResNet



(e) Shallow CNN,
6 Layers
(viii) Maize



(f) Shallow CNN,
13 Layers



(g) Input Image

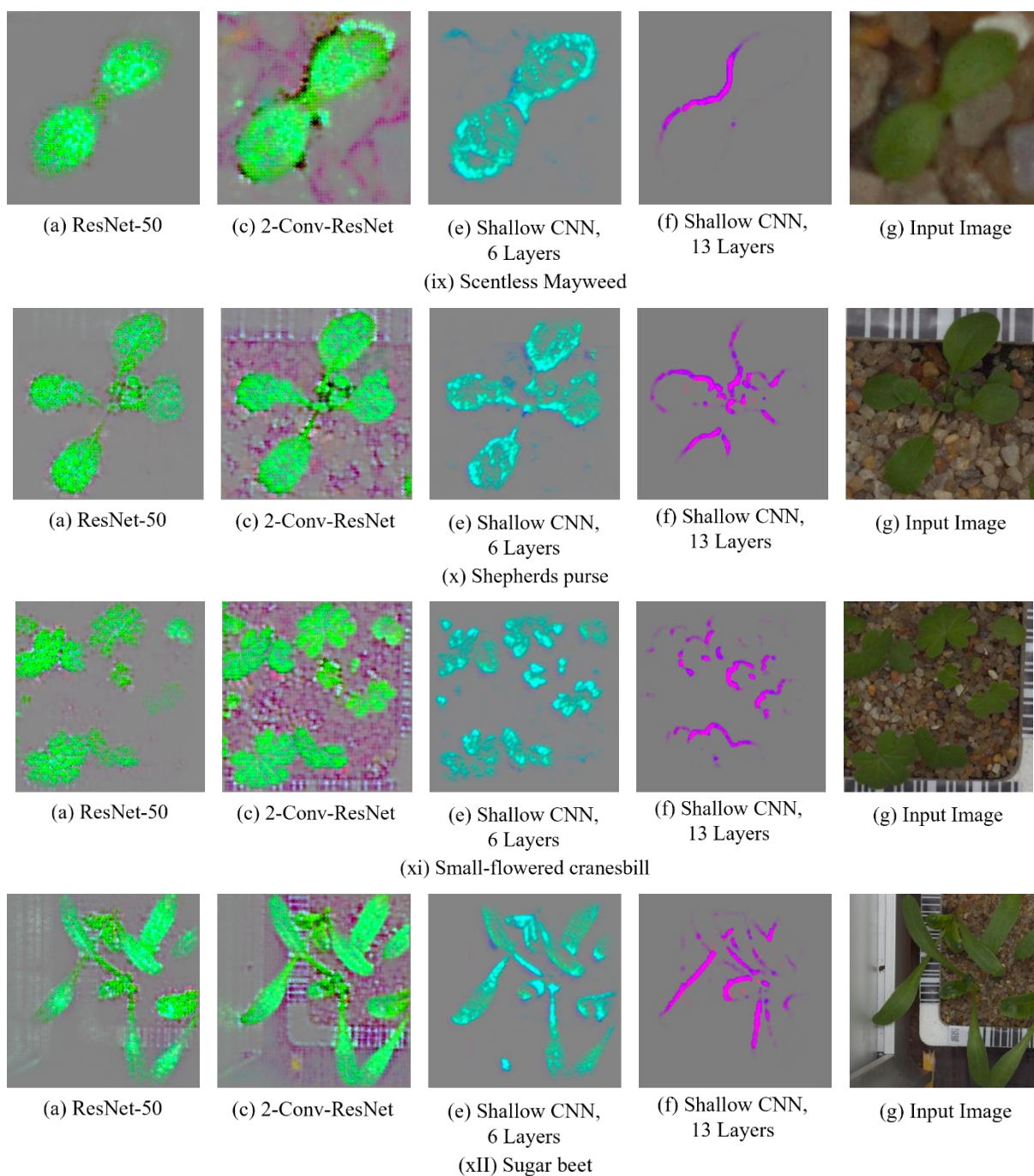


Figure 3: GBP visualization of the last convolutional layer of different CNN models for the different classes of the Plant Seedling dataset.

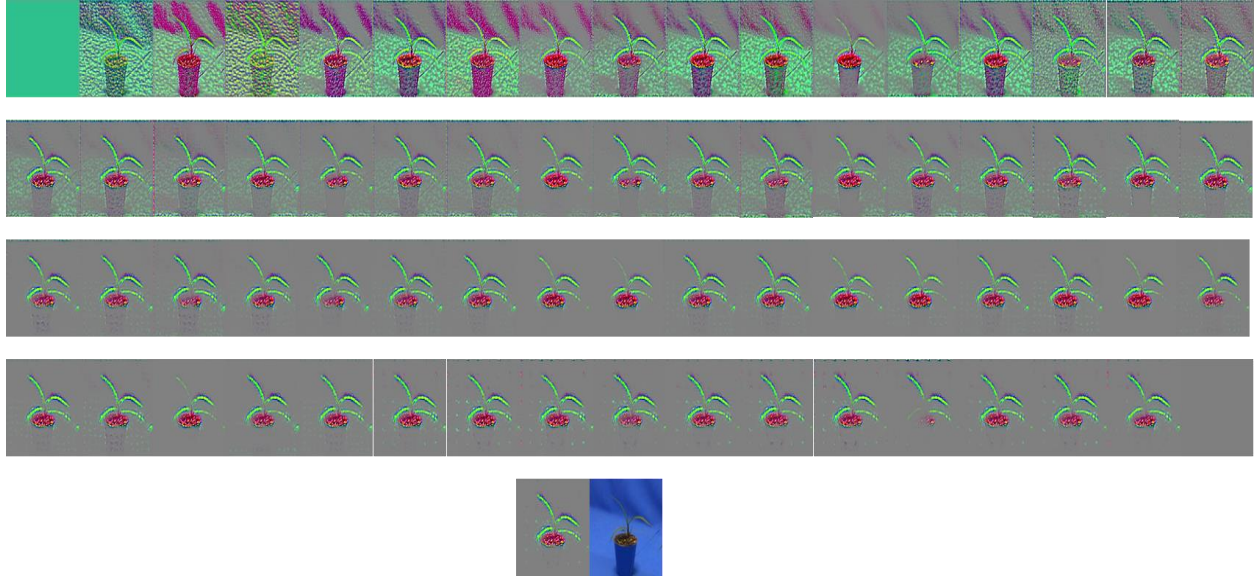


Figure 4: Visualization of the learning of the intermediate layers of ResNet-50 using GBP for Barnyard Grass of the Weedling dataset.

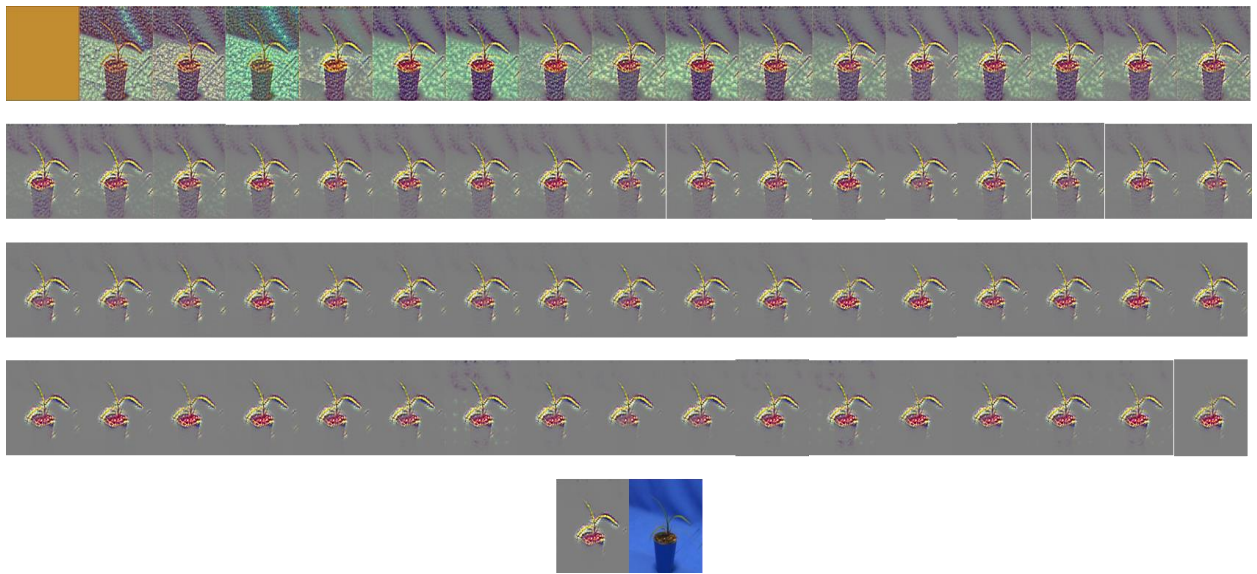


Figure 5: Visualization of the learning of the intermediate layers of ResNet-50-10% using GBP for Barnyard Grass of the Weedling dataset.



Figure 6: Visualization of the learning of the intermediate layers of 2-Conv-ResNet using GBP for Barnyard Grass of the Weedling dataset.



Figure 7: Visualization of the learning of the intermediate layers of 2-Conv-ResNet-10% using GBP for Barnyard Grass of the Weedling dataset.

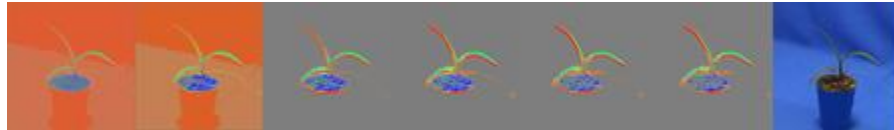
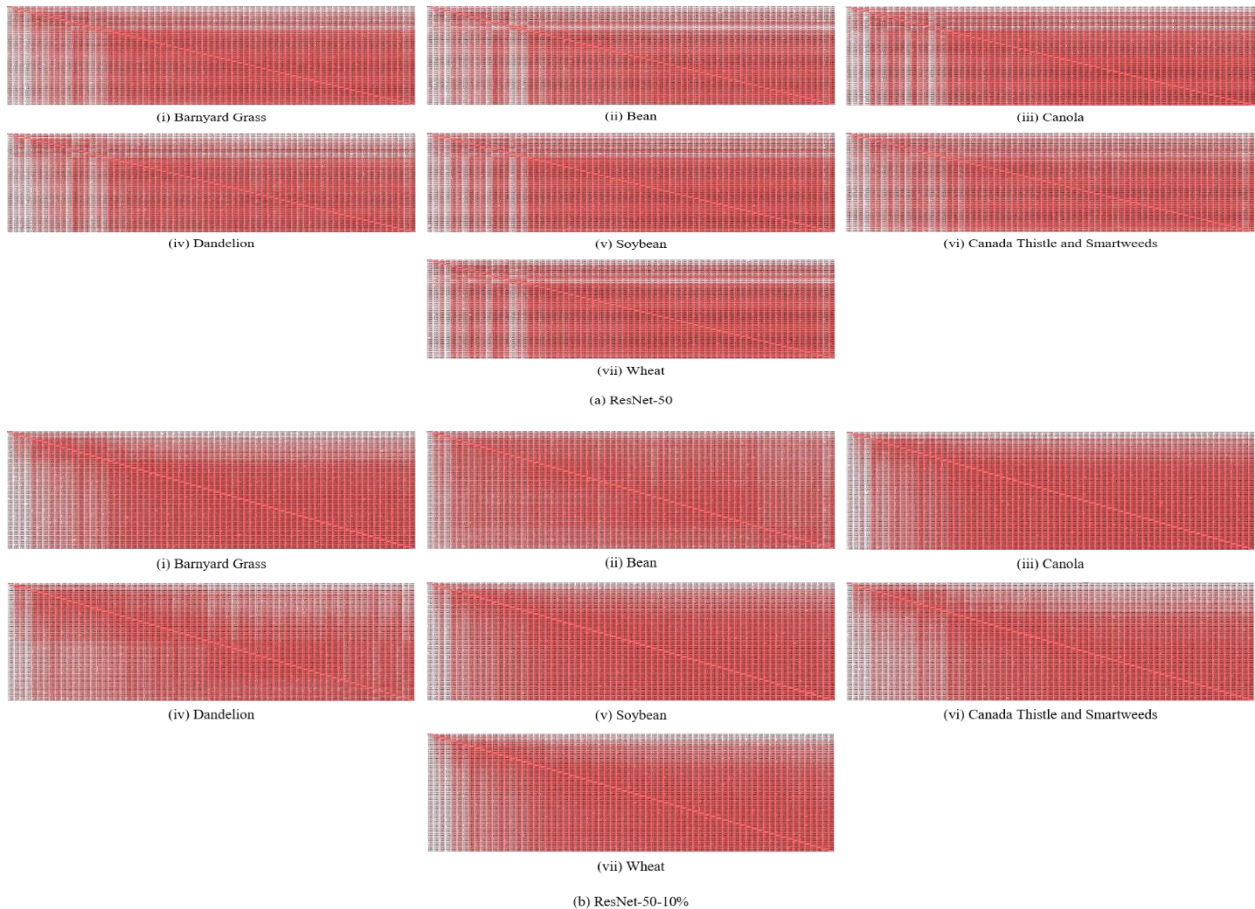


Figure 8: Visualization of the learning of the intermediate layers of Shallow-CNN, 6 layers using GBP for Barnyard Grass of the Weedling dataset.



Figure 9: Visualization of the learning of the intermediate layers of Shallow-CNN, 13 layers using GBP for Barnyard Grass of the Weedling dataset.



	0.700385	0.705522	0.76122	0.70603	0.757941	0.758619	0.758618	0.758819	0.757801	0.757995	0.757628	0.757315
0.76088	1	0.985548	0.977769	0.98025	0.984954	0.982895	0.979546	0.978776	0.980887	0.982627	0.982638	0.985658
0.755322	0.950348	1	0.989827	0.980478	0.975474	0.968023	0.954841	0.959529	0.962123	0.959852	0.958996	0.960433
0.76122	0.937790	0.989827	1	0.991744	0.984441	0.986803	0.984543	0.984732	0.984824	0.981767	0.981602	0.981009
0.76051	0.96051	0.984678	0.987874	1	0.991248	0.9884	0.984249	0.986832	0.987172	0.986814	0.984546	0.98484
0.75944	0.938794	0.977478	0.988841	0.971248	1	0.992031	0.979751	0.980379	0.981238	0.979423	0.978897	0.977724
0.76071	0.962328	0.984651	0.988884	0.9844	0.992031	1	0.989873	0.989447	0.987495	0.987773	0.987737	0.987734
0.76084	0.957788	0.976461	0.984361	0.98829	0.979751	0.989974	1	0.996235	0.995513	0.993577	0.991135	0.991135
0.76131	0.959789	0.982599	0.984272	0.982552	0.983179	0.990447	0.990235	1	0.997744	0.997124	0.996446	0.996446
0.75781	0.958142	0.981231	0.984834	0.987722	0.981438	0.985439	0.990513	0.991744	1	0.997174	0.996846	0.996846
0.757399	0.958212	0.979142	0.981747	0.979423	0.987773	0.994313	0.997124	0.997174	0.998227	1	0.998227	0.998227
0.757628	0.956126	0.980896	0.982623	0.981446	0.978746	0.972747	0.983187	0.985448	0.986244	0.986227	1	0.987955
0.757148	0.956455	0.980451	0.981089	0.9808	0.977724	0.987739	0.991123	0.994849	0.994849	0.994827	0.993955	1

(i) Barnyard Grass

0.76524	0.767442	0.76824	0.775085	0.769888	0.767945	0.764783	0.769328	0.768389	0.767617	0.768142	0.768317	0.768367
0.76744	1	0.977944	0.984429	0.987772	0.984755	0.982679	0.982646	0.982737	0.984844	0.984739	0.984813	0.984812
0.76524	0.947348	1	0.981336	0.984788	0.982618	0.981205	0.98453	0.98087	0.984275	0.984285	0.984285	0.984285
0.77008	0.958422	0.986188	1	0.988025	0.982144	0.977742	0.977444	0.977125	0.979462	0.980727	0.980793	0.981444
0.76508	0.98777	0.984786	0.988025	1	0.990277	0.986823	0.977285	0.97749	0.977752	0.980222	0.984519	0.982781
0.76743	0.982759	0.988094	0.988444	0.989277	1	0.989217	0.979867	0.979862	0.980761	0.984813	0.984813	0.985333
0.76478	0.982873	0.981635	0.979742	0.988884	0.988187	1	0.979462	0.977124	0.979777	0.977122	0.980634	0.979793
0.768328	0.985946	0.98453	0.977484	0.977285	0.978747	0.979482	1	0.994123	0.988895	0.987772	0.987734	0.987273
0.76897	0.984737	0.984442	0.979333	0.977495	0.979751	0.977716	0.994033	1	0.99237	0.996221	0.988134	0.988446
0.76757	0.984144	0.984847	0.979462	0.977052	0.979773	0.979777	0.988895	0.99237	1	0.991644	0.987448	0.987678
0.769142	0.984187	0.984277	0.98627	0.98623	0.986781	0.971132	0.987772	0.990221	0.991644	1	0.990221	0.991644
0.769377	0.984121	0.984285	0.987751	0.986233	0.986453	0.986238	0.986238	0.986238	0.986238	0.990221	1	0.990455
0.76887	0.985832	0.984248	0.987344	0.987793	0.986133	0.986273	0.986834	0.988378	0.988773	0.988448	0.988448	1

(iv) Dandelion

0.760887	0.758884	0.758825	0.759433	0.753338	0.752807	0.753222	0.752317	0.758213	0.758868	0.749832	0.749335
0.758887	1	0.988877	0.987122	0.98884	0.987122	0.98884	0.988813	0.988813	0.988813	0.984888	0.984888
0.758884	0.950872	1	0.977475	0.987737	0.986222	0.986977	0.985844	0.985844	0.985844	0.982487	0.984771
0.758825	0.957121	0.971879	1	0.988803	0.987122	0.977411	0.979444	0.984788	0.984411	0.981248	0.981248
0.759433	0.95884	0.988773	0.988803	1	0.991135	0.988813	0.979434	0.979751	0.984548	0.981248	0.981248
0.753338	0.958884	0.986222	0.982623	0.981248	1	0.988844	0.981248	0.979751	0.977412	0.984788	0.981248
0.752807	0.988844	0.986977	0.977122	0.988844	0.986944	1	0.988813	0.988844	0.979434	0.981248	0.981248
0.758213	0.988813	0.988844	0.988844	0.988844	0.988844	0.988844	1	0.988844	0.988844	0.988844	0.988844
0.758868	0.955122	0.988844	0.988844	0.988844	0.988844	0.988844	0.988844	1	0.988844	0.988844	0.988844
0.749832	0.955122	0.988844	0.988844	0.988844	0.988844	0.988844	0.988844	0.988844	1	0.988844	0.988844
0.749335	0.955122	0.988844	0.988844	0.988844	0.988844	0.988844	0.988844	0.988844	0.988844	1	0.988844

(ii) Bean

0.811084	0.809779	0.812757	0.811121	0.809838	0.809955	0.811156	0.810945	0.809875	0.809919	0.809791	0.809127
0.81088	1	0.981127	0.981279	0.981044	0.981044	0.981159	0.981279	0.981045	0.981045	0.981045	0.981045
0.809779	0.981127	1	0.981223	0.981451	0.981451	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.811121	0.981279	0.981451	1	0.981223	0.981451	0.981451	0.981223	0.981223	0.981223	0.981223	0.981223
0.809838	0.981044	0.981044	0.981223	1	0.981223	0.981451	0.981223	0.981223	0.981223	0.981223	0.981223
0.809955	0.981159	0.981223	0.981451	0.981223	1	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.811156	0.981279	0.981451	0.981451	0.981223	0.981451	1	0.981223	0.981223	0.981223	0.981223	0.981223
0.810945	0.981045	0.981045	0.981223	0.981223	0.981223	0.981223	1	0.981223	0.981223	0.981223	0.981223
0.809875	0.981045	0.981045	0.981223	0.981223	0.981223	0.981223	0.981223	1	0.981223	0.981223	0.981223
0.809919	0.981045	0.981045	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	1	0.981223	0.981223
0.809127	0.981045	0.981045	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	1	0.981223

(v) Soybean

0.674554	0.684784	0.689025	0.68681	0.687479	0.687558	0.687971	0.687678	0.68888	0.688812	0.688434	0.68663
0.67724	1	0.988888	0.981222	0.987777	0.987777	0.987777	0.987777	0.987777	0.987777	0.987777	0.987777
0.684784	0.984888	1	0.977777	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888
0.689025	0.981222	0.977777	1	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888
0.68681	0.987777	0.984888	0.984888	1	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888
0.687479	0.984888	0.984888	0.984888	0.984888	1	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888
0.687558	0.984888	0.984888	0.984888	0.984888	0.984888	1	0.984888	0.984888	0.984888	0.984888	0.984888
0.687971	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888	1	0.984888	0.984888	0.984888	0.984888
0.68888	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888	1	0.984888	0.984888	0.984888
0.688812	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888	1	0.984888	0.984888
0.688434	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888	0.984888	1	0.984888

(vi) Wheat

0.748623	0.748624	0.758889	0.758285	0.757541	0.759713	0.756571	0.75888	0.7588	0.758483	0.759115	0.758623
0.758889	1	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.758285	0.981223	1	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.757541	0.981223	0.981223	1	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.759713	0.981223	0.981223	0.981223	1	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.75888	0.981223	0.981223	0.981223	0.981223	1	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.7588	0.981223	0.981223	0.981223	0.981223	0.981223	1	0.981223	0.981223	0.981223	0.981223	0.981223
0.758483	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	1	0.981223	0.981223	0.981223	0.981223
0.759115	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	1	0.981223	0.981223	0.981223
0.758623	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	1	0.981223	0.981223

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0.81281	0.81281	0.81281	0.81281	0.81281	0.81281	0.81281	0.81281	0.81281	0.81281	0.81281	0.81281
0.81281	1	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.81281	0.981223	1	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.81281	0.981223	0.981223	1	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.81281	0.981223	0.981223	0.981223	1	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.81281	0.981223	0.981223	0.981223	0.981223	1	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.81281	0.981223	0.981223	0.981223	0.981223	0.981223	1	0.981223	0.981223	0.981223	0.981223	0.981223
0.81281	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	1	0.981223	0.981223	0.981223	0.981223
0.81281	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	1	0.981223	0.981223	0.981223
0.81281	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	1	0.981223	0.981223
0.81281	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	1	0.981223
0.81281	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	1
0.81281	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
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0.81281	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
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0.81281	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
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0.81281	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.81281	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.81281	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.81281	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223	0.981223
0.81281	0.981223										

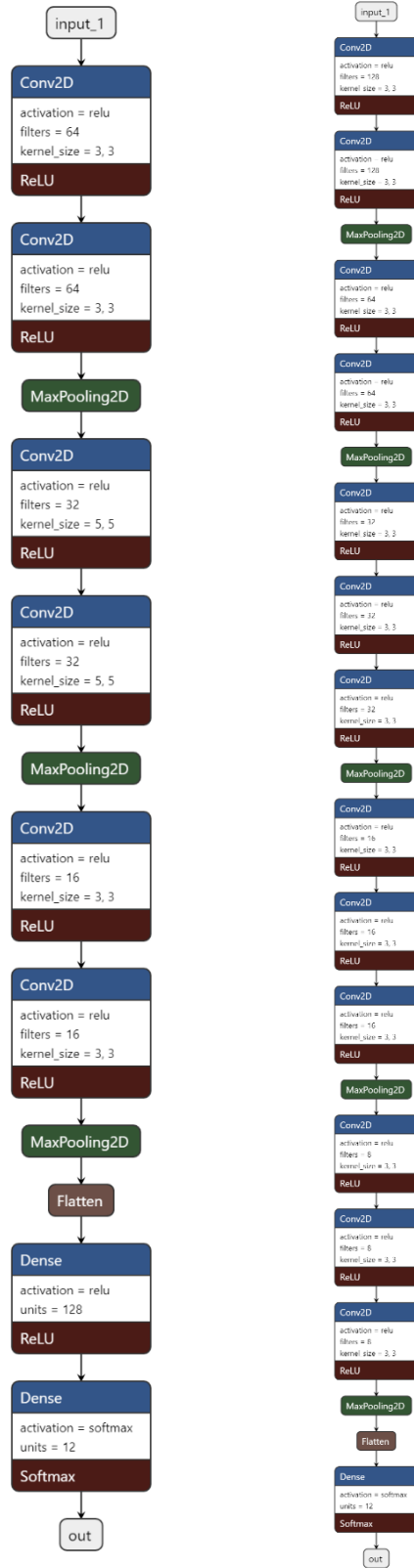


Figure 11: Model Architecture of the Shallow CNN, 6 Layers (left), and Shallow CNN, 13 Layers (right)