Supplementary Material of "RVFL-X: A Novel Randomized Network Based on Complex Transformed Real-Valued Tabular Datasets"

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TABLE S.I: Accuracy of the proposed RVFL-X models and the baseline models on C-1 category datasets.

Dataset ↓ | Model →	RVFL [1]	RVFLwoDL [2]	IFRVFL [3]	GEELM-LDA [4]	GEELM-LFDA [4]	Total-var-RVFL [5]	MCVELM [6]	NF-RVFL-R [7]	NF-RVFL-K [7]	NF-RVFL-C [7]	RVFL-X-N†	RVFL-X-Auto†
acute_inflammation	100	100	100	100	100	100	100	100	100	100	100	100
acute_nephritis	100	100	100	95.8333	95.8333	100	100	100	100	100	100	100
breast_cancer_wisc	88.5653	87.9897	89.8499	86.5591	84.2724	88.704	88.8448	88.2785	88.4183	87.705	90.2785	89.9897
chess_krvkp	72.0313	71.936	72.6262	76.7814	69.2351	73.7833	73.7828	82.6045	81.7908	85.2322	83.0741	84.5757
congressional_voting	63.6782	63.2184	58.8506	59.7701	54.2529	63.908	63.4483	63.908	63.908	64.1379	63.6782	64.8276
credit_approval	85.2174	85.3623	86.5217	85.5072	85.6522	85.5072	85.5072	85.942	85.942	85.7971	85.5072	86.087
cylinder_bands	66.4154	65.8081	63.4875	67.5405	67.5385	67.7727	66.0156	68.9606	69.724	70.1294	70.1256	70.3103
echocardiogram	84.6724	83.9031	80.7692	73.2194	68.661	85.4701	85.4986	85.4416	85.4416	85.4416	85.4416	86.2108
haberman_survival	73.4902	73.8181	75.1348	55.5632	52.2898	74.4738	73.4902	75.1296	75.1296	75.4574	74.146	75.4574
ilpd_indian_liver	71.5311	72.2149	72.7277	61.7521	61.4353	72.5626	72.5508	72.3932	72.3917	72.2178	72.3814	73.4188
mammographic	79.9196	79.2978	79.7107	75.7572	73.7932	80.0237	80.2332	79.2957	79.504	79.1899	80.2321	79.1942
monks_1	83.7934	82.1654	84.6895	73.5811	71.5476	84.1538	84.8697	81.4527	82.3584	84.342	93.5151	90.8156
monks_2	80.0138	81.6804	82.6722	60.7273	57.23	85.8485	82.8499	85.8485	87.3774	87.3774	89.0041	87.5028
monks_3	91.1564	90.7912	90.0704	82.8419	74.5602	91.6986	91.8821	91.8436	91.6486	92.1744	92.9615	93.1433
pima	72.0075	72.2698	73.8282	66.401	54.0625	72.92	72.9166	73.6983	72.9174	72.6594	73.824	74.3545
pittsburg_bridges_T_OR_D	87.1905	87.1905	89.1905	82.1429	80.1905	89.1429	90.1429	90.1905	88.2381	90.1905	90.1429	90.2381
planning	71.3814	71.3814	69.8048	59.1592	61.1261	72.4925	73.048	73.018	71.9369	71.9369	72.4925	73.033
spect	68.3019	66.7925	68.3019	63.3962	62.6415	69.0566	67.9245	69.0566	69.434	68.6792	68.3019	70.1887
statlog_heart	80.3704	80	81.8519	73.7037	74.8148	81.4815	82.5926	81.4815	82.2222	81.8519	81.8519	82.2222
tic_tac_toe	88.8264	88.9278	81.4316	94.6875	79.2059	91.8521	90.0769	65.3125	68.5684	79.3216	94.5681	84.6564
vertebral_column_2clases	71.2903	70.6452	85.4839	94.8387	92.2581	72.5806	74.5161	79.0323	81.6129	80.3226	73.5484	83.871
Average	79.993	79.7806	80.3335	75.703	72.4096	81.1158	80.9615	80.6137	80.884	81.6269	82.6226	**82.8618**

TABLE S.II: Accuracy of the proposed RVFL-X models and the baseline models on C-2 category datasets.

Dataset ↓ | Model →	RVFL [1]	RVFLwoDL [2]	IFRVFL [3]	GEELM-LDA [4]	GEELM-LFDA [4]	Total-var-RVFL [5]	MCVELM [6]	NF-RVFL-R [7]	NF-RVFL-K [7]	NF-RVFL-C [7]	RVFL-X-N†	RVFL-X-Auto†
adult	84.0342	83.8725	83.5438	83.422	83.1784	84.0178	83.9011	83.2992	83.5879	84.6218	84.6976	84.6259
bank	89.4051	89.4934	89.1173	89.6042	46.4966	89.6705	89.6703	89.4269	89.4492	89.9139	89.8475	89.8032
breast_cancer_wisc_diag	93.8503	92.2683	89.2719	93.1455	86.988	94.1997	93.4995	94.3751	94.3782	95.6063	95.4324	95.08
breast_cancer_wisc_prog	81.359	80.3846	78.359	62.0897	62.8462	82.359	81.8718	83.359	81.8846	80.9103	81.8718	82.8462
conn_bench_sonar_mines_rocks	62.079	60.5226	54.8316	80.5343	73.6585	64.4251	64.4251	65.8885	66.2602	63.4611	63.4959	74.007
connect_4	75.4518	75.4059	75.3407	76.7316	75.4281	75.4992	75.4459	75.4844	75.5022	76.2156	77.2266	77.0017
hill_valley	82.2603	79.7014	80.2772	76.9231	80.3846	83.6592	80.0289	82.8429	82.6732	83.0874	83.0028	85.9742
ionosphere	88.6358	86.9175	84.3581	83.2274	82.664	89.4809	88.326	88.3461	89.7626	88.9095	91.7505	90.8974
magic	78.7487	78.5279	77.5289	77.4289	78.3579	78.7171	78.7592	76.3407	76.3302	78.4017	79.3218	82.224
mushroom	96.3931	96.0735	93.9684	96.3071	98.7561	97.2919	96.7382	92.6761	95.9132	99.3351	97.7596	97.6118
oocytes_merluccius_nucleus_4d	82.2884	81.5045	79.1554	81.9957	82.7273	82.3883	82.1942	81.6021	81.7006	82.1923	83.5643	83.4605
oocytes_trisopterus_nucleus_2f	78.9419	77.5182	75.2219	78.0694	79.8889	79.6013	79.6025	79.3863	79.3779	79.9345	80.8119	82.4566
ringnorm	51.5541	51.5405	51.473	51.5541	51.5784	52.0405	51.9459	51.6081	51.6486	51.6892	51.7973	52.0135
spambase	88.546	87.0472	85.0883	88.9582	88.546	88.6116	87.4382	88.9582	88.9583	89.3931	89.2423	89.3075
Average	80.9677	80.0556	78.3954	79.9994	76.5356	81.5687	80.9891	80.971	81.2448	81.6908	82.1302	**83.3793**

TABLE S.III: Accuracy of the proposed RVFL-X models and the baseline models on C-3 category datasets.

Dataset ↓ | Model →	RVFL [1]	RVFLwoDL [2]	Total-var-RVFL [5]	MCVELM [6]	NF-RVFL-R [7]	NF-RVFL-K [7]	NF-RVFL-C [7]	RVFL-X-N†	RVFL-X-Auto†
annealing	89.6381	88.1918	89.1937	88.6381	86.6313	87.0782	90.8591	91.0832	91.4165
audiology_std	69.3205	65.7564	50.3718	51.8846	71.3846	70.3718	67.8077	71.359	70.3462
balance_scale	98.4	98.4	98.56	98.56	98.4	98.24	98.24	98.72	98.56
car	72.6265	72.1057	72.6234	72.2758	70.0139	70.8337	71.0626	73.2048	72.1642
contrac	40.458	40.1183	41.3386	41.0688	41.4934	42.3673	41.5416	41.6089	45.6813
dermatology	97.5379	97.0011	97.2714	97.5417	97.5454	97.8193	97.5379	97.8119	97.5417
ecoli	60.9175	61.2116	51.0667	51.0667	60.619	60.6277	61.5145	60.9175	62.7085
energy_y1	88.6716	88.2777	89.7106	89.0604	87.889	88.5434	89.0595	91.7927	90.7555
energy_y2	90.4932	90.4932	91.14	90.7538	89.3269	89.1928	89.8404	91.9243	92.0567
glass	37.6855	39.0808	34.4297	37.6855	42.3477	42.8239	40.4873	39.546	44.1971
hayes_roth	61.875	60.625	62.5	61.875	61.875	61.875	65	65	65
heart_cleveland	59.7268	59.377	61.0328	59.3607	61.0383	61.3388	60.0437	61.0383	61.6721
heart_va	40	40	40.5	40	41	42.5	41.5	41	41.5
iris	74.6667	74	74.6667	77.3333	73.3333	74.6667	74.6667	79.3333	85.3333
led_display	72.6	72.5	73.5	72.8	72.7	72.2	73.4	73.6	73.5
lymphography	86.4138	85.0345	86.4138	86.4368	85.7701	87.1034	88.5057	88.4368	87.7931
nursery	70.3935	70.1775	63.0093	62.8627	66.7824	66.3889	71.9444	78.1481	77.1373
pittsburg_bridges_REL_L	62.1429	63.1429	64.1429	67.0952	67.2381	69.0476	62.1905	65.1905	68.0952
seeds	89.0476	87.1429	90	89.0476	90.4762	90	90.4762	90	90.4762
soybean	87.6954	86.9579	88.4264	88.275	87.3991	88.1387	90.4723	90.3231	90.1803
teaching	69.3763	69.3763	70.6882	72.7097	70.7312	70.043	70.7097	72.0215	72.6882
vertebral_column_3clases	65.1613	65.1613	84.1935	84.1935	67.4194	69.0323	65.4839	65.8065	68.3871
yeast	57.0077	57.4117	57.4133	57.1444	55.6593	56.0005	56.8064	57.8171	57.5475
Average	71.385	70.9367	70.9649	71.203	71.6119	72.0101	72.137	73.2906	**74.119**

TABLE S.IV: Accuracy of the proposed RVFL-X models and the baseline models on C-4 category datasets.

Dataset ↓ | Model →	RVFL [1]	RVFLwoDL [2]	Total-var-RVFL [5]	MCVELM [6]	NF-RVFL-R [7]	NF-RVFL-K [7]	NF-RVFL-C [7]	RVFL-X-N[†]	RVFL-X-Auto[†]
abalone	63.4665	63.4419	63.754	63.6578	63.8253	64.1365	64.0887	63.8735	64.1126
cardiotocography_10clases	65.9924	65.2894	66.1351	66.2307	62.9851	62.8425	69.2395	71.6383	71.3568
cardiotocography_3clases	86.1733	85.5622	86.0808	85.9382	84.6213	84.2003	85.4674	86.3151	86.2216
conn_bench_vowel_deterding	95.8586	95.1515	96.1616	95.7576	87.9798	88.7879	92.2222	96.1616	96.3636
image_segmentation	87.6623	87.0996	88.3117	87.4459	83.2035	83.5931	83.6797	89.4372	89.2641
letter	80.505	79.695	80.67	79.86	61.14	63.205	81.605	82.21	82.33
low_res_spect	87.7605	86.6285	73.9852	74.1721	87.3849	87.5666	87.7605	88.8873	88.8873
oocytes_merluccius_states_2f	91.2846	90.8948	91.8737	91.483	91.3845	91.1894	92.067	92.3625	92.4605
oocytes_trisopterus_states_5b	87.9385	85.853	89.3647	87.8286	87.7205	87.2816	87.7175	89.2584	88.9221
optical	95.4626	94.3594	95.4626	94.8754	93.3808	94.0214	97.0107	97.4733	97.4021
page_blocks	95.4137	95.4137	95.4136	95.3952	94.6645	94.7012	94.7558	95.5963	95.5416
pendigits	98.5353	98.4716	98.6354	98.5262	92.7402	94.6233	97.5345	98.6262	98.6718
semeion	87.0673	82.4233	87.2562	83.0492	88.0726	88.5732	87.3187	90.2072	89.8925
statlog_image	95.1948	94.8918	95.6277	95.2814	91.5584	91.5584	93.0736	96.0606	96.1905
statlog_landsat	82.0513	81.4141	82.2999	81.7249	80.4196	81.3209	81.2898	82.6107	82.6884
statlog_shuttle	98.6483	98.6241	98.681	98.6793	98.6345	98.6638	98.6724	98.7224	98.7328
statlog_vehicle	82.0327	81.5593	82.0313	81.3227	79.1974	79.5475	82.2666	83.2175	83.3317
thyroid	95.625	95.4722	95.7917	95.5833	94.6667	94.7639	96.0278	96.0417	96.0278
wall_following	75.6057	75.239	75.734	75.1845	71.518	72.1223	79.583	81.1777	80.2244
waveform	86.54	85.98	86.56	86.26	86.88	86.68	87.22	87.26	87.24
waveform_noise	86.28	85.02	86.42	85.42	86.28	86.3	86.58	86.46	86.46
wine_quality_white	52.3699	52.5332	52.472	52.4103	52.4106	52.6349	53.4925	53.1047	53.4311
Average	85.3395	84.5917	84.9419	84.3676	82.7576	83.1052	85.3942	**86.6683**	<u>86.6252</u>