

Supplementary Material

Table S1: **CNC estimation using Self-Supervised learning.** Results obtained on Grosseto CCC and CNC test sets using different hyperparameters to estimate the CNC parameter. The model was trained for 1500 epochs for each experiment using the SGD optimizer.

		Non-static		Static		Random	
LR	Layers	R2	RMSE	R2	RMSE	R2	RMSE
0.05	[102, 12, 1]	0.8686	1.0044	0.8766	0.9736	0.8588	1.0412
0.01	[102, 12, 1]	0.8609	1.0334	0.8763	0.9744	0.9034	0.8613
0.005	[102, 12, 1]	0.9152	0.8069	0.8659	1.0146	0.8615	1.0313
0.05	[102, 25, 1]	0.8910	0.9150	0.8645	1.0199	0.9064	0.8480
0.01	[102, 25, 1]	0.8759	0.9763	0.8589	1.0410	0.7937	1.2587
0.005	[102, 25, 1]	0.8762	0.9752	0.8287	1.1467	0.8388	1.1125
0.05	[102, 51, 1]	0.8738	0.9844	0.8560	1.0514	0.8610	1.0331
0.01	[102, 51, 1]	0.9186	0.7908	0.8576	1.0456	0.8415	1.1033
0.005	[102, 51, 1]	0.8959	0.8939	0.8401	1.1081	0.8500	1.0733
0.05	[102, 102, 1]	0.8416	1.1027	0.8649	1.0186	0.8167	1.1863
0.01	[102, 102, 1]	0.8961	0.8930	0.8597	1.0379	0.8395	1.1102
0.005	[102, 102, 1]	0.8778	0.9688	0.8366	1.1201	0.7631	1.3488
0.05	[102, 51, 25, 1]	0.8618	1.0301	0.8669	1.0109	0.8664	1.0129
0.01	[102, 51, 25, 1]	0.8958	0.8944	0.8530	1.0626	0.8527	1.0634
0.005	[102, 51, 25, 1]	0.8823	0.9506	0.8426	1.0994	0.8621	1.0291
0.05	[102, 51, 51, 1]	0.9083	0.8392	0.8805	0.9579	0.8782	0.9669
0.01	[102, 51, 51, 1]	0.9140	0.8126	0.8527	1.0635	0.8403	1.1075
0.005	[102, 51, 51, 1]	0.8963	0.8922	0.8516	1.0674	0.8996	0.8779
0.05	[102, 102, 51, 1]	0.8518	1.0668	0.8761	0.9752	0.8500	1.0730
0.01	[102, 102, 51, 1]	0.8790	0.9640	0.8426	1.0992	0.8699	0.9996
0.005	[102, 102, 51, 1]	0.8845	0.9419	0.8471	1.0837	0.8536	1.0603
0.05	[102, 102, 102, 1]	0.8816	0.9534	0.8701	0.9986	0.7856	1.2829
0.01	[102, 102, 102, 1]	0.8567	1.0491	0.8611	1.0328	0.9109	0.8274
0.005	[102, 102, 102, 1]	0.9028	0.8639	0.8669	1.0109	0.8766	0.9733
Average:		0.8836	0.9418	0.8582	1.0423	0.8533	1.0534

Table S2: **CCC estimation using Self-Supervised learning.** Results obtained on Grosseto CCC and CNC test sets using different hyperparameters to estimate the CCC parameter. The model was trained for 1500 epochs for each experiment using the SGD optimizer.

		Non-static		Static		Random	
LR	Layers	R2	RMSE	R2	RMSE	R2	RMSE
0.05	[102, 12, 1]	0.8299	0.2504	0.7449	0.3066	0.7472	0.3052
0.01	[102, 12, 1]	0.7831	0.2827	0.8147	0.2613	0.7619	0.2962
0.005	[102, 12, 1]	0.8000	0.2715	0.8062	0.2673	0.7990	0.2721
0.05	[102, 25, 1]	0.8167	0.2599	0.8237	0.2549	0.7789	0.2854
0.01	[102, 25, 1]	0.8052	0.2680	0.8063	0.2672	0.7070	0.3286
0.005	[102, 25, 1]	0.7575	0.2990	0.8160	0.2604	0.8232	0.2553
0.05	[102, 51, 1]	0.7635	0.2952	0.7737	0.2888	0.7893	0.2787
0.01	[102, 51, 1]	0.7669	0.2931	0.8314	0.2493	0.6651	0.3513
0.005	[102, 51, 1]	0.7853	0.2813	0.8113	0.2637	0.6735	0.3469
0.05	[102, 102, 1]	0.8201	0.2575	0.8196	0.2579	0.7285	0.3163
0.01	[102, 102, 1]	0.8048	0.2682	0.8267	0.2527	0.7236	0.3191
0.005	[102, 102, 1]	0.8267	0.2528	0.8007	0.2710	0.7487	0.3043
0.05	[102, 51, 25, 1]	0.7528	0.3018	0.7863	0.2806	0.7495	0.3038
0.01	[102, 51, 25, 1]	0.8249	0.2541	0.8070	0.2667	0.8027	0.2697
0.005	[102, 51, 25, 1]	0.8289	0.2511	0.8105	0.2643	0.7650	0.2943
0.05	[102, 51, 51, 1]	0.7993	0.2720	0.8024	0.2699	0.7725	0.2896
0.01	[102, 51, 51, 1]	0.8117	0.2634	0.8044	0.2685	0.8156	0.2607
0.005	[102, 51, 51, 1]	0.7747	0.2881	0.7831	0.2827	0.7894	0.2786
0.05	[102, 102, 51, 1]	0.8157	0.2606	0.8204	0.2573	0.7181	0.3223
0.01	[102, 102, 51, 1]	0.8266	0.2528	0.8073	0.2665	0.7950	0.2749
0.005	[102, 102, 51, 1]	0.7983	0.2726	0.8235	0.2550	0.6871	0.3396
0.05	[102, 102, 102, 1]	0.7703	0.2910	0.8147	0.2613	0.7763	0.2871
0.01	[102, 102, 102, 1]	0.8029	0.2695	0.8318	0.2490	0.6919	0.3370
0.005	[102, 102, 102, 1]	0.8040	0.2688	0.8180	0.2590	0.7107	0.3265
Average:		0.7987	0.2719	0.8077	0.2659	0.7508	0.3018

Table S3: **CCC estimation using MLP and PCA.** Results obtained on Grosseto CCC test sets using only the MLP regressor and PCA features in input with different hyperparameters to estimate the CCC parameter. The model was trained for 1500 epochs for each experiment using the SGD optimizer.

		PCA-05		PCA-10		PCA-15		PCA-20	
LR	dims	R2	RMSE	R2	RMSE	R2	RMSE	R2	RMSE
0.05	[pca, 12, 1]	0.7356	0.3122	0.809	0.2653	0.7882	0.2794	0.8157	0.2606
0.01	[pca, 12, 1]	0.7922	0.2768	0.7982	0.2727	0.7782	0.2859	0.7904	0.2779
0.005	[pca, 12, 1]	0.3463	0.4908	0.795	0.2748	0.772	0.2899	0.7692	0.2917
0.05	[pca, 25, 1]	0.6883	0.3389	0.8021	0.2701	0.793	0.2762	0.7924	0.2766
0.01	[pca, 25, 1]	0.7707	0.2907	0.8132	0.2624	0.7941	0.2755	0.7869	0.2803
0.005	[pca, 25, 1]	0.7847	0.2817	0.6981	0.3336	0.7607	0.297	0.7755	0.2876
0.05	[pca, 51, 1]	0.7357	0.3121	0.8138	0.2619	0.8275	0.2521	0.7316	0.3145
0.01	[pca, 51, 1]	0.7656	0.2939	0.801	0.2708	0.7913	0.2773	0.7761	0.2872
0.005	[pca, 51, 1]	0.7917	0.2771	0.7607	0.297	0.7721	0.2898	0.8091	0.2653
0.05	[pca, 102, 1]	0.7945	0.2752	0.8141	0.2617	0.8151	0.261	0.7852	0.2814
0.01	[pca, 102, 1]	0.7707	0.2907	0.7897	0.2784	0.7481	0.3047	0.7565	0.2996
0.005	[pca, 102, 1]	0.6874	0.3394	0.7673	0.2928	0.8057	0.2676	0.7562	0.2998
0.05	[pca, 51, 25, 1]	0.7576	0.2989	0.7987	0.2723	0.7895	0.2785	0.7961	0.2741
0.01	[pca, 51, 25, 1]	0.492	0.4327	0.809	0.2653	0.791	0.2775	0.7864	0.2806
0.005	[pca, 51, 25, 1]	0.7514	0.3027	0.7773	0.2865	0.7302	0.3153	0.751	0.3029
0.05	[pca, 51, 51, 1]	0.7724	0.2896	0.7854	0.2812	0.8072	0.2666	0.7977	0.2731
0.01	[pca, 51, 51, 1]	0.5873	0.39	0.5642	0.4008	0.8042	0.2686	0.797	0.2735
0.005	[pca, 51, 51, 1]	0.6822	0.3423	0.6877	0.3392	0.7916	0.2771	0.8092	0.2652
0.05	[pca, 102, 51, 1]	0.7423	0.3082	0.781	0.2841	0.8166	0.26	0.7957	0.2744
0.01	[pca, 102, 51, 1]	0.6511	0.3586	0.7881	0.2795	0.7898	0.2784	0.6595	0.3542
0.005	[pca, 102, 51, 1]	0.6405	0.364	0.7522	0.3022	0.7801	0.2847	0.6066	0.3808
0.05	[pca, 102, 102, 1]	0.7208	0.3208	0.7704	0.2909	0.7878	0.2797	0.7878	0.2796
0.01	[pca, 102, 102, 1]	0.7127	0.3254	0.7874	0.2799	0.7851	0.2814	0.7897	0.2784
0.005	[pca, 102, 102, 1]	0.7564	0.2996	0.4268	0.4596	0.7729	0.2893	0.7496	0.3038
Average:		0.7054	0.3255	0.7579	0.2951	0.7872	0.2797	0.7696	0.2901

Table S4: **CNC estimation using MLP and PCA.** Results obtained on Grosseto CNC test sets using only the MLP regressor and PCA features in input with different hyperparameters to estimate the CNC parameter. The model was trained for 1500 epochs for each experiment using the SGD optimizer.

		PCA-05		PCA-10		PCA-15		PCA-20	
LR	dims	R2	RMSE	R2	RMSE	R2	RMSE	R2	RMSE
0.05	[pca, 12, 1]	0.8576	1.0458	0.8421	1.101	0.8264	1.1547	0.8135	1.1966
0.01	[pca, 12, 1]	0.8022	1.2324	0.8659	1.0147	0.8533	1.0613	0.8397	1.1096
0.005	[pca, 12, 1]	0.7651	1.343	0.8907	0.9162	0.8569	1.0482	0.7626	1.3501
0.05	[pca, 25, 1]	0.8467	1.0849	0.8169	1.1858	0.8686	1.0044	0.8627	1.0268
0.01	[pca, 25, 1]	0.8047	1.2244	0.8584	1.0426	0.8739	0.9839	0.8838	0.9444
0.005	[pca, 25, 1]	0.7897	1.2706	0.8841	0.9434	0.8759	0.9762	0.8724	0.9899
0.05	[pca, 51, 1]	0.8045	1.2253	0.8659	1.0149	0.8599	1.0371	0.8644	1.0205
0.01	[pca, 51, 1]	0.7184	1.4705	0.8584	1.0428	0.8727	0.9888	0.8844	0.9421
0.005	[pca, 51, 1]	0.8013	1.2353	0.8768	0.9725	0.8833	0.9468	0.8434	1.0966
0.05	[pca, 102, 1]	0.8231	1.1655	0.8628	1.0264	0.8701	0.9985	0.8519	1.0663
0.01	[pca, 102, 1]	0.7956	1.2529	0.8719	0.9917	0.8371	1.1183	0.8605	1.0351
0.005	[pca, 102, 1]	0.8372	1.1181	0.8521	1.0656	0.8679	1.0071	0.8457	1.0884
0.05	[pca, 51, 25, 1]	0.8161	1.1882	0.8356	1.1237	0.8571	1.0474	0.8547	1.0561
0.01	[pca, 51, 25, 1]	0.8549	1.0555	0.884	0.9436	0.8763	0.9745	0.8687	1.0042
0.005	[pca, 51, 25, 1]	0.7996	1.2404	0.8819	0.9521	0.8772	0.971	0.8793	0.9627
0.05	[pca, 51, 51, 1]	0.8387	1.1128	0.8692	1.002	0.8695	1.0011	0.8689	1.0034
0.01	[pca, 51, 51, 1]	0.7378	1.4189	0.8567	1.049	0.8521	1.0658	0.7994	1.2411
0.005	[pca, 51, 51, 1]	0.8028	1.2304	0.8684	1.0051	0.8535	1.0607	0.8773	0.9707
0.05	[pca, 102, 51, 1]	0.8101	1.2075	0.7862	1.2812	0.8513	1.0684	0.8712	0.9945
0.01	[pca, 102, 51, 1]	0.8528	1.0633	0.8861	0.9351	0.8833	0.9465	0.8701	0.9988
0.005	[pca, 102, 51, 1]	0.8427	1.099	0.8584	1.0426	0.8545	1.057	0.88	0.96
0.05	[pca, 102, 102, 1]	0.8315	1.1376	0.8498	1.0738	0.8706	0.9968	0.8749	0.9801
0.01	[pca, 102, 102, 1]	0.7632	1.3483	0.8359	1.1224	0.871	0.9951	0.8833	0.9466
0.005	[pca, 102, 102, 1]	0.7375	1.4198	0.8774	0.9701	0.8802	0.9589	0.8844	0.9421
Average:		0.8056	1.2163	0.8598	1.0341	0.8643	1.0195	0.8582	1.0386

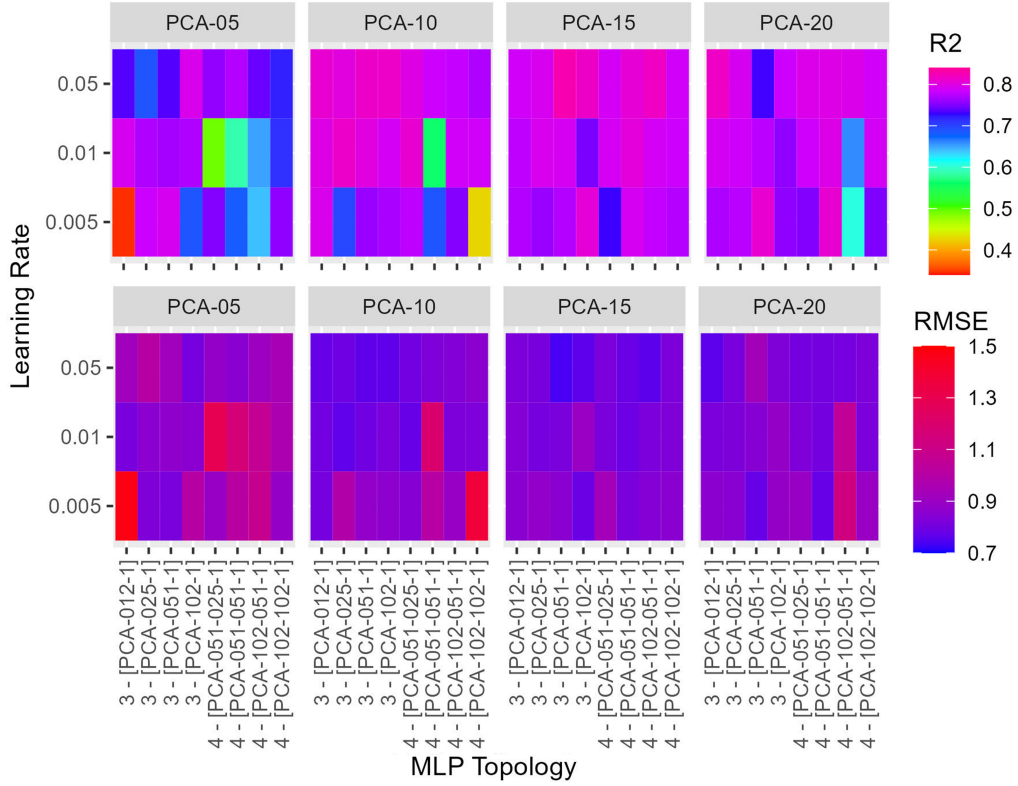


Figure S1: **Graphical representation of the CCC estimation using MLP and PCA.** Results obtained on Grosseto CCC and CNC test sets using only the MLP regressor and PCA features in input with different hyperparameters to estimate the CCC parameter. The model was trained for 1500 epochs for each experiment using the SGD optimizer.

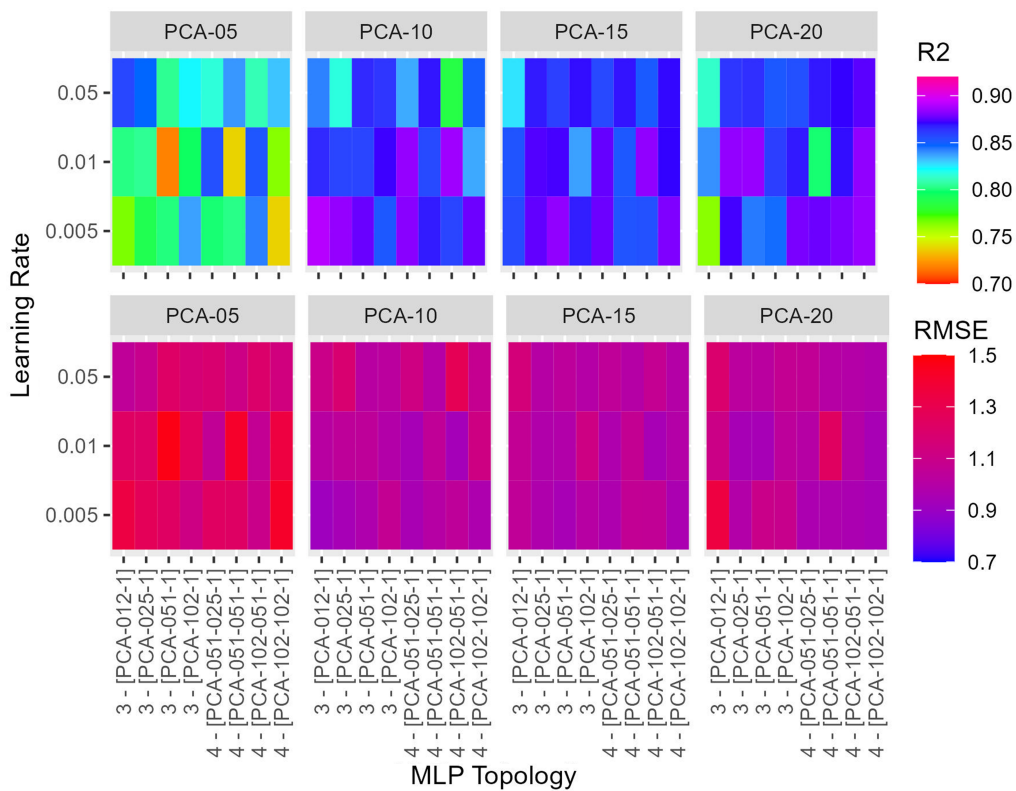


Figure S2: **Graphical representation of the CNC estimation using MLP and PCA.** Results obtained on Grosseto CCC and CNC test sets using only the MLP regressor and PCA features in input with different hyperparameters to estimate the CNC parameter. The model was trained for 1500 epochs for each experiment using the SGD optimizer.