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Reassess The Model

Number of metrics: 11 | Number of models: 31

Models Performance Matrix

	PR-AUC	Best F-1	VUS	MutualInformation	CDI	MAE	MSE	SMAPE	MAPE	LIKELIHOOD	CENTRALITY_4	SYNTHETIC_F1_spikes	SYNTHETIC_PR-AUC_spikes	SYNTHETIC_VUS_spikes
ABOD_1	0.402480	0.717641	0.888164	0.278276	129.484734	0.041651	0.008871	0.331905	0.281556	0.319148	0.00	0.869560	0.947167	0.943873
ABOD_2	0.402480	0.717641	0.888164	0.278276	129.484734	0.041651	0.008871	0.331905	0.281556	0.319148	0.00	0.869560	0.947167	0.943873
ABOD_3	0.402480	0.717641	0.888164	0.278276	129.484734	0.041651	0.008871	0.331905	0.281556	0.319148	0.00	0.869560	0.947167	0.943873
ABOD_4	0.402480	0.717641	0.888164	0.278276	129.484734	0.041651	0.008871	0.331905	0.281556	0.319148	0.00	0.869560	0.947167	0.943873
CBLOF_1	0.424214	0.747610	0.912929	0.278276	203.504749	0.052582	0.011654	0.460531	0.334015	0.303810	277965.50	0.739584	0.829656	0.849681
CBLOF_2	0.414648	0.717641	0.886292	0.278276	215.878887	0.053254	0.011595	0.456815	0.343092	0.307324	365421.00	0.735451	0.843579	0.865026
CBLOF_3	0.500358	0.853470	0.873045	0.278276	380.597460	0.057107	0.015749	0.449955	0.342077	0.303396	464425.50	0.736421	0.830529	0.847889
CBLOF_4	0.474333	0.808876	0.912027	0.278276	227.097929	0.049208	0.011141	0.398567	0.298051	0.313040	280273.50	0.711480	0.820680	0.844718
DGHL_1	0.613427	0.881171	0.903028	0.278276	86.236402	0.025335	0.004241	0.777511	21.247829	0.318908	183346.00	0.779779	0.853079	0.900502
DGHL_2	0.606484	0.867610	0.901779	0.278276	122.652508	0.031065	0.005816	0.808293	18.033461	0.312911	123393.50	0.768312	0.820702	0.888014
DGHL_3	0.610731	0.867610	0.899038	0.278276	126.616353	0.030854	0.005715	0.812641	18.545223	0.306996	120183.00	0.767455	0.820063	0.888062
DGHL_4	0.610007	0.876056	0.901384	0.278276	120.123792	0.030450	0.005321	0.814387	28.989094	0.304289	119077.50	0.765700	0.824305	0.889482
LOF_1	0.494323	0.849726	0.872113	0.278276	193.871669	0.014542	0.004062	0.058623	0.068691	0.361644	0.00	0.859102	0.907322	0.897447
LOF_2	0.494323	0.849726	0.872113	0.278276	193.871669	0.014542	0.004062	0.058623	0.068691	0.361644	0.00	0.859102	0.907322	0.897447
LOF_3	0.494323	0.849726	0.872113	0.278276	193.871669	0.014542	0.004062	0.058623	0.068691	0.361644	0.00	0.859102	0.907322	0.897447
LOF_4	0.494323	0.849726	0.872113	0.278276	193.871669	0.014542	0.004062	0.058623	0.068691	0.361644	0.00	0.859102	0.907322	0.897447
LSTMVAE_1	0.726423	0.845409	0.694684	0.278276	98.496618	0.079355	0.026261	1.084287	7996.444824	0.271804	65186.50	0.919019	0.965676	0.955467
LSTMVAE_2	0.747817	0.864315	0.699874	0.278276	164.719069	0.079789	0.026094	1.082143	8137.268066	0.259825	66967.75	0.925735	0.974110	0.958618
LSTMVAE_3	0.507024	0.845409	0.700701	0.278276	181.171436	0.076095	0.026657	1.072564	4536.330078	0.294657	52944.50	0.928207	0.971707	0.960570
LSTMVAE_4	0.733256	0.845409	0.697792	0.278276	103.830750	0.078165	0.026444	1.085880	6187.570801	0.276356	57510.25	0.932595	0.975100	0.959954
MD_1	0.553089	0.925494	0.887176	0.278276	238.461508	0.082438	0.036037	0.656468	1362.842896	0.296318	346334.00	0.872979	0.910701	0.896985
NN_1	0.142483	0.466700	0.595776	0.137642	inf	0.034969	0.007928	0.583942	412.764282	0.342345	302153.25	0.616054	0.442544	0.772810
NN_2	0.142303	0.466700	0.584875	0.137642	inf	0.033418	0.007258	0.386764	553.919739	0.349366	250363.75	0.616054	0.440273	0.769705
NN_3	0.143285	0.466700	0.579816	0.137642	inf	0.034861	0.008110	0.363443	1386.000244	0.343581	266148.25	0.616054	0.440705	0.766271
RM_1	0.656442	0.910723	0.906627	0.278276	12.884261	0.005191	0.000433	0.069570	37.295021	0.372872	569821.75	0.818900	0.905694	0.920100
RM_2	0.577377	0.819931	0.902887	0.278276	43.245751	0.011920	0.001801	0.129631	70.278709	0.367386	496548.25	0.914226	0.964493	0.949542
RM_3	0.520390	0.717641	0.873819	0.275150	84.457031	0.024898	0.004625	0.244175	172.580551	0.353291	561719.00	0.888462	0.948466	0.944992
RNN_1	0.548139	0.772582	0.919989	0.278276	89.616041	0.017339	0.002671	0.794457	1407.812866	0.323665	454760.75	0.867601	0.942639	0.927432
RNN_2	0.560858	0.798758	0.919526	0.278276	109.339258	0.015382	0.002561	0.794994	1402.308716	0.316633	412354.75	0.871689	0.944137	0.929185
RNN_3	0.584773	0.808701	0.926536	0.278276	100.795720	0.016168	0.002646	0.771865	542.978882	0.330982	404389.50	0.898773	0.958265	0.941039
RNN_4	0.578338	0.775285	0.929371	0.278276	99.497209	0.016883	0.002599	0.798356	1010.104370	0.309027	418772.00	0.902633	0.957194	0.935807

Models Rank Matrix (f1)

	rank
ABOD_1	0.925494
ABOD_2	0.910723
ABOD_3	0.881171
ABOD_4	0.876056
CBLOF_1	0.867610
CBLOF_2	0.867610
CBLOF_3	0.864315
CBLOF_4	0.853470
DGHL_1	0.849726
DGHL_2	0.849726
DGHL_3	0.849726
DGHL_4	0.849726
LOF_1	0.845409
LOF_2	0.845409
LOF_3	0.845409
LOF_4	0.819931
LSTMVAE_1	0.808876

LSTMVAE_2	0.808701
LSTMVAE_3	0.798758
LSTMVAE_4	0.775285
MD_1	0.772582
NN_1	0.747610
NN_2	0.717641
NN_3	0.717641
RM_1	0.717641
RM_2	0.717641
RM_3	0.717641
RNN_1	0.717641
RNN_2	0.466700
RNN_3	0.466700
RNN_4	0.466700

average rank values

	rank
ABOD_1	26
ABOD_2	27
ABOD_3	21
ABOD_4	22
CBLOF_1	29
CBLOF_2	25
CBLOF_3	24
CBLOF_4	19
DGHL_1	12
DGHL_2	18
DGHL_3	15
DGHL_4	16
LOF_1	11
LOF_2	3
LOF_3	7
LOF_4	2
LSTMVAE_1	10
LSTMVAE_2	23
LSTMVAE_3	5
LSTMVAE_4	14
MD_1	20
NN_1	4
NN_2	8
NN_3	9
RM_1	1
RM_2	6
RM_3	17
RNN_1	13
RNN_2	30
RNN_3	28
RNN_4	31

markov_aggregated_rank

	rank
ABOD_1	0.466700
ABOD_2	0.849726
ABOD_3	0.845409
ABOD_4	0.910723
CBLOF_1	0.845409
CBLOF_2	0.808876
CBLOF_3	0.849726
CBLOF_4	0.849726

DGHL_1	0.876056
DGHL_2	0.864315
DGHL_3	0.775285
DGHL_4	0.849726
LOF_1	0.819931
LOF_2	0.881171
LOF_3	0.867610
LOF_4	0.867610
LSTMVAE_1	0.845409
LSTMVAE_2	0.808701
LSTMVAE_3	0.772582
LSTMVAE_4	0.717641
MD_1	0.747610
NN_1	0.717641
NN_2	0.717641
NN_3	0.717641
RM_1	0.853470
RM_2	0.798758
RM_3	0.717641
RNN_1	0.717641
RNN_2	0.466700
RNN_3	0.925494
RNN_4	0.466700

copeland_rank

	rank
ABOD_1	0.819931
ABOD_2	0.466700
ABOD_3	0.466700
ABOD_4	0.910723
CBLOF_1	0.466700
CBLOF_2	0.849726
CBLOF_3	0.849726
CBLOF_4	0.772582
DGHL_1	0.849726
DGHL_2	0.845409
DGHL_3	0.849726
DGHL_4	0.717641
LOF_1	0.845409
LOF_2	0.808876
LOF_3	0.845409
LOF_4	0.867610
LSTMVAE_1	0.876056
LSTMVAE_2	0.881171
LSTMVAE_3	0.867610
LSTMVAE_4	0.717641
MD_1	0.925494
NN_1	0.717641
NN_2	0.717641
NN_3	0.747610
RM_1	0.864315
RM_2	0.853470
RM_3	0.717641
RNN_1	0.808701
RNN_2	0.717641
RNN_3	0.798758
RNN_4	0.775285

spearmans_footrule

	rank
ABOD_1	0.910723
ABOD_2	0.819931
ABOD_3	0.864315
ABOD_4	0.845409
CBLOF_1	0.717641
CBLOF_2	0.772582
CBLOF_3	0.775285
CBLOF_4	0.717641
DGHL_1	0.845409
DGHL_2	0.798758
DGHL_3	0.849726
DGHL_4	0.849726
LOF_1	0.876056
LOF_2	0.717641
LOF_3	0.867610
LOF_4	0.717641
LSTMVAE_1	0.881171
LSTMVAE_2	0.925494
LSTMVAE_3	0.849726
LSTMVAE_4	0.849726
MD_1	0.808701
NN_1	0.717641
NN_2	0.808876
NN_3	0.747610
RM_1	0.717641
RM_2	0.853470
RM_3	0.845409
RNN_1	0.867610
RNN_2	0.466700
RNN_3	0.466700
RNN_4	0.466700

Models Borda Rank from F1 Matrix

	rank
ABOD_1	0.775285
ABOD_2	0.808701
ABOD_3	0.845409
ABOD_4	0.466700
CBLOF_1	0.772582
CBLOF_2	0.910723
CBLOF_3	0.819931
CBLOF_4	0.845409
DGHL_1	0.849726
DGHL_2	0.845409
DGHL_3	0.849726
DGHL_4	0.864315
LOF_1	0.881171
LOF_2	0.717641
LOF_3	0.717641
LOF_4	0.717641
LSTMVAE_1	0.867610
LSTMVAE_2	0.466700
LSTMVAE_3	0.808876
LSTMVAE_4	0.876056
MD_1	0.925494
NN_1	0.747610
NN_2	0.867610

NN_3	0.853470
RM_1	0.717641
RM_2	0.717641
RM_3	0.849726
RNN_1	0.849726
RNN_2	0.717641
RNN_3	0.466700
RNN_4	0.798758

Models Trimmed Borda Rank Matrix

	rank
ABOD_1	0.808701
ABOD_2	0.717641
ABOD_3	0.845409
ABOD_4	0.845409
CBLOF_1	0.775285
CBLOF_2	0.772582
CBLOF_3	0.798758
CBLOF_4	0.925494
DGHL_1	0.849726
DGHL_2	0.466700
DGHL_3	0.864315
DGHL_4	0.845409
LOF_1	0.867610
LOF_2	0.717641
LOF_3	0.881171
LOF_4	0.747610
LSTMVAE_1	0.808876
LSTMVAE_2	0.466700
LSTMVAE_3	0.717641
LSTMVAE_4	0.849726
MD_1	0.849726
NN_1	0.717641
NN_2	0.867610
NN_3	0.853470
RM_1	0.717641
RM_2	0.717641
RM_3	0.876056
RNN_1	0.849726
RNN_2	0.910723
RNN_3	0.466700
RNN_4	0.819931

Models Partial Borda Rank Matrix

	rank
ABOD_1	0.775285
ABOD_2	0.775285
ABOD_3	0.849726
ABOD_4	0.775285
CBLOF_1	0.849726
CBLOF_2	0.845409
CBLOF_3	0.717641
CBLOF_4	0.717641
DGHL_1	0.808876
DGHL_2	0.867610
DGHL_3	0.881171
DGHL_4	0.849726
LOF_1	0.853470
LOF_2	0.717641

LOF_3	0.867610
LOF_4	0.717641
LSTMVAE_1	0.849726
LSTMVAE_2	0.925494
LSTMVAE_3	0.747610
LSTMVAE_4	0.876056
MD_1	0.845409
NN_1	0.717641
NN_2	0.775285
NN_3	0.845409
RM_1	0.864315
RM_2	0.466700
RM_3	0.775285
RNN_1	0.775285
RNN_2	0.775285
RNN_3	0.775285
RNN_4	0.775285

Models Trimmed Partial Borda Rank Matrix

	rank
ABOD_1	0.775285
ABOD_2	0.775285
ABOD_3	0.876056
ABOD_4	0.775285
CBLOF_1	0.775285
CBLOF_2	0.775285
CBLOF_3	0.849726
CBLOF_4	0.747610
DGHL_1	0.853470
DGHL_2	0.849726
DGHL_3	0.808876
DGHL_4	0.849726
LOF_1	0.717641
LOF_2	0.717641
LOF_3	0.881171
LOF_4	0.717641
LSTMVAE_1	0.867610
LSTMVAE_2	0.864315
LSTMVAE_3	0.717641
LSTMVAE_4	0.867610
MD_1	0.849726
NN_1	0.717641
NN_2	0.775285
NN_3	0.845409
RM_1	0.845409
RM_2	0.845409
RM_3	0.775285
RNN_1	0.775285
RNN_2	0.775285
RNN_3	0.775285
RNN_4	0.775285

Models Borda Trimmed Rank Matrix

	rank
ABOD_1	0.910723
ABOD_2	0.819931
ABOD_3	0.717641
ABOD_4	0.881171
CBLOF_1	0.772582

CBLOF_2	0.845409
CBLOF_3	0.775285
CBLOF_4	0.808701
DGHL_1	0.845409
DGHL_2	0.798758
DGHL_3	0.876056
DGHL_4	0.867610
LOF_1	0.867610
LOF_2	0.717641
LOF_3	0.717641
LOF_4	0.717641
LSTMVAE_1	0.717641
LSTMVAE_2	0.864315
LSTMVAE_3	0.845409
LSTMVAE_4	0.849726
MD_1	0.849726
NN_1	0.849726
NN_2	0.849726
NN_3	0.747610
RM_1	0.717641
RM_2	0.808876
RM_3	0.925494
RNN_1	0.853470
RNN_2	0.466700
RNN_3	0.466700
RNN_4	0.466700

EMPIRICAL INFLUENCE AND ROBUST RANK AGGREGATION

	cluster
0	0
1	0
2	0
3	0
4	0
5	1
6	0
7	0
8	0

Most reliable cluster idx: 0,Largest 0

Statistics

Rank by PR-AUC : ['LSTMVAE_2', 'LSTMVAE_4', 'LSTMVAE_1', 'RM_1', 'DGHL_1', 'DGHL_3', 'DGHL_4', 'DGHL_2', 'RNN_3', 'RNN_4', 'RM_2', 'RNN_2', 'MD_1', 'RNN_1', 'RM_3', 'LSTMVAE_3', 'CBLOF_3', 'LOF_4', 'LOF_2', 'LOF_1', 'LOF_3', 'CBLOF_4', 'CBLOF_1', 'CBLOF_2', 'ABOD_4', 'ABOD_3', 'ABOD_2', 'ABOD_1', 'NN_3', 'NN_1', 'NN_2']

Rank by F1 : ['MD_1', 'RM_1', 'DGHL_1', 'DGHL_4', 'DGHL_2', 'DGHL_3', 'LSTMVAE_2', 'CBLOF_3', 'LOF_3', 'LOF_2', 'LOF_1', 'LOF_4', 'LSTMVAE_4', 'LSTMVAE_1', 'LSTMVAE_3', 'RM_2', 'CBLOF_4', 'RNN_3', 'RNN_2', 'RNN_4', 'RNN_1', 'CBLOF_1', 'ABOD_4', 'ABOD_3', 'RM_3', 'ABOD_2', 'CBLOF_2', 'ABOD_1', 'NN_1', 'NN_2', 'NN_3']

Kemeny Predicted rank : ['RM_3', 'RNN_1', 'LSTMVAE_4', 'LSTMVAE_3', 'RNN_2', 'LSTMVAE_2', 'RNN_4', 'RM_2', 'MD_1', 'RNN_3', 'LOF_3', 'LOF_2', 'DGHL_1', 'ABOD_1', 'CBLOF_4', 'ABOD_2', 'DGHL_2', 'RM_1', 'CBLOF_2', 'DGHL_3', 'LOF_4', 'ABOD_4', 'CBLOF_3', 'DGHL_4', 'ABOD_3', 'CBLOF_1', 'LSTMVAE_1', 'LOF_1', 'NN_2', 'NN_1', 'NN_3']

Max PR-AUC: 0.747817329749749 is achieved by LSTMVAE_2

Max F-1: 0.9254939390127008 is achieved by MD_1

Our chosen model is : RM_3 which has PR-AUC (using Kemeny)= 0.5203904369866907 and best F-1= 0.7176413464750855

(Normalized Discounted Cumulative Gain) NDCG of predicted ranks with PR-AUC= 0.9116556198969724 and best F-1= 0.9700682307524602