End-to-end Face Detection and Cast Grouping in Movies Using Erdős-Rényi Clustering: Supplementary Material

SouYoung Jin[1], Hang Su[1], Chris Stauffer[2], and Erik Learned-Miller[1]

[1]College of Information and Computer Sciences, University of Massachusetts, Amherst
[2]Visionary Systems and Research (VSR)

Table 1: Clustering performance comparisons on various data sets. The leftmost shows our **rank1count** by setting a threshold automatically. For the rest of the columns, we show f-scores using optimal (oracle-supplied) thresholds. (**1st place**,**2nd place**,**3rd place**).

			Verification system + Link-based clustering algorithm					Other clustering algorithms					
	Test set		**Rank-1 Count (automatic threshold)**	**Rank-1 Count**	L2	Template Adaptation [2]	Rank-Order Distance [10]	Rank-Order Distance based Clustering [10]	Affinity Propagation [4]	DBSCAN [3]	Spectral Clustering [8]	Birch [9]	MiniBatch KMeans [7]
Video	BBT s01 [1]	e01	.7145	.7225	**.7386**	.7170	**.8064**	**.7278**	.1707	.4137	.6884	.3776	.2166
		e02	.7414	**.7671**	**.7561**	**.7520**	.7154	.6537	.1593	.3216	.6147	.2337	.2018
		e03	**.8428**	**.8552**	**.8329**	.8192	.6660	.6367	.2130	.2985	.6578	.2366	.2131
		e04	**.7602**	**.7690**	.7151	**.7687**	.6364	.7001	.2118	.2886	.6520	.2156	.1847
		e05	**.8217**	**.8250**	.7420	**.7858**	.6330	.7035	.2335	.2444	.5980	.1812	.2120
		e06	**.7563**	**.7578**	.6342	**.7247**	.5577	.5588	.1615	.1948	.5806	.1511	.1387
	Buffy s05 [1]	e01	**.6634**	**.6938**	.4950	**.6902**	.3819	.5935	.1711	.1755	.5762	.1439	.1285
		e02	.5582	**.6645**	.3315	.5452	.2800	**.5837**	.1705	.1185	**.5892**	.1151	.1087
		e03	**.5378**	**.5479**	.3735	**.5569**	.2390	.4595	.1346	.1322	.4566	.1077	.1063
		e04	.4203	**.4859**	.3523	.4549	.3049	**.5171**	.1643	.1445	**.5273**	.1187	.1179
		e05	**.6235**	**.6952**	.5064	**.6739**	.3073	.5640	.1435	.1740	.5540	.1390	.1251
		e06	**.5932**	**.6923**	.3001	**.5856**	.2807	.5455	.1765	.1009	.5071	.1041	.0995
	Hannah [6]		**.6436**	**.6813**	.2581	.3620	**.4123**	.3955	.1886	.1230	.3344	.1240	.1052
Image	LFW [5]		**.8532**	**.8943**	**.8498**	.3735	.5989	.5812	.3197	.0117	.2538	.4520	.3133

1. Performance Comparisons

In Table 1, except for the leftmost column of results, we report the best $F_{0.5}$ scores using optimal (oracle-supplied) thresholds for both the distance threshold (a parameter that is part of all of the algorithms) and the number of clusters (a parameter required by a subset of the algorithms, such as k-nearest neighbors). **The comparison shows that the proposed link-based clustering algorithm with rank-1 counts outperforms the state-of-the-art on all four data sets in $F_{0.5}$ score**. Unlike other clustering algorithms, our proposed approach can scale from small clustering problems (5-8 subjects in BBT) to large clustering problems (5730 subjects in LFW).

In Table 2, we also report traditional measures (pairwise precision, pairwise recall, and F-measure) on the subset of true positive tracklets that are given to each algorithm.

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Table 2: Clustering performance comparisons evaluated on traditional measures. (**1st place**,**2nd place**,**3rd place**).

	Test set		Verification system + Link-based clustering algorithm					Other clustering algorithms					
			Rank-1 Count (automatic threshold)	**Rank-1 Count**	L2	Template Adaptation [2]	Rank-Order Distance [10]	Rank-Order Distance based Clustering [10]	Affinity Propagation [4]	DBSCAN [3]	Spectral Clustering [8]	Birch [9]	MiniBatch KMeans [7]
Video	BBT s01 [1]	e01	.8226	.8486	**.8613**	.8364	**.9669**	**.8732**	.2108	.4880	.8193	.4572	.2666
		e02	.9289	**.9726**	**.9550**	**.9502**	.9046	.8456	.2034	.4094	.7785	.2997	.2584
		e03	**.9664**	**.9908**	**.9903**	.9299	.7873	.7751	.2437	.4404	.7810	.3158	.2775
		e04	**.8985**	**.9188**	.8638	**.9107**	.8040	.8387	.2592	.3831	.8207	.2863	.2385
		e05	**.9769**	**.9940**	.9215	**.9275**	.7879	.8067	.2600	.3866	.7638	.2713	.3354
		e06	**.9795**	**.9876**	.8605	**.9644**	.7828	.7041	.2085	.3930	.8408	.2859	.2538
	Buffy s05 [1]	e01	**.8487**	**.8727**	.7016	**.8626**	.5447	.7249	.1997	.2968	.7512	.2123	.1835
		e02	**.6737**	**.7665**	.4904	.6730	.4104	.6384	.1883	.2386	**.8196**	.1932	.1764
		e03	**.6872**	**.7159**	.5492	**.7404**	.3731	.6094	.1538	.2494	.6392	.1725	.1638
		e04	.5496	**.5847**	.4983	.5586	.4570	**.6789**	.1854	.2603	**.6943**	.1854	.1733
		e05	**.8205**	**.8301**	.6682	**.8173**	.4751	.6663	.1573	.3536	.7686	.2279	.2019
		e06	**.7509**	**.8555**	.4281	**.7083**	.4489	.6224	.2071	.1925	.7188	.1727	.1583
	Hannah [6]		**.7634**	**.8081**	.3526	.4766	**.5249**	.4955	.2272	.1723	.4227	.1648	.1387
Image	LFW [5]		**.8532**	**.8943**	**.8498**	.3735	.5989	.5812	.3197	.0117	.2538	.4520	.3133

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