SUPPLEMENT: MAPPER INTERACTIVE: A SCALABLE, EXTENDABLE, AND INTERACTIVE TOOLBOX FOR THE VISUAL EXPLORATION OF HIGH-DIMENSIONAL DATA

Dataset	MI	GT	KM	GT*	KM*	MI/KM	GT*/GT	KM*/KM
ImageNet	3.64	1.82	2.35	6.67	2.62	1.55×	3.66×	1.11×
Cifar	1.23	0.57	0.74	1.90	1.16	1.66×	3.33×	1.57×
Random	0.51	0.34	0.37	1.35	0.71	1.38×	3.97×	1.92×

Table 2: Peak memory usage (in Gigabytes) on three datasets, each with 100K points.

# Pts	Int	MI	GT	KM	GT*	KM*	KM/MI	GT/GT*	KM/KM*
ImageNet dataset									
1×10^2	5	0.01	0.27	0.21	0.1	0.21	21.0 ×	2.7 ×	1.0 ×
1×10^3	10	0.05	0.79	0.65	0.11	0.65	13.0 ×	7.18 ×	1.0 ×
1×10^4	20	0.99	4.83	5.52	0.69	2.42	5.58 ×	7.0 ×	2.28 ×
1×10^5	100	22.08	135.29	143.04	13.82	22.26	6.48 ×	9.79 ×	6.43 ×
3×10^5	200	99.74	562.19	578.84	60.99	88.03	5.8 ×	9.22 ×	6.58 ×
Cifar dataset									
1×10^2	5	0.01	0.18	0.31	0.1	0.31	31.0 ×	1.8 ×	1.0 ×
1×10^3	10	0.05	0.45	0.94	0.11	0.96	18.8 ×	4.09 ×	0.98 ×
1×10^4	20	0.82	3.0	3.78	0.46	2.07	4.61 ×	6.52 ×	1.83 ×
1×10^5	100	12.73	43.9	57.51	7.45	15.71	4.52 ×	5.89 ×	3.66 ×
1×10^6	500	265.86	932.77	1182.85	171.97	214.24	4.45 ×	5.42 ×	5.52 ×
3×10^6	1500	931.73	3392.51	3740.08	1025.79	802.77	4.01 ×	3.31 ×	4.66 ×
Random dataset									
1×10^2	5	0.01	0.1	0.51	0.1	0.52	51.0 ×	1.0 ×	0.98 ×
1×10^3	10	0.02	0.43	0.73	0.12	0.74	36.5 ×	3.58 ×	0.99 ×
1×10^4	20	0.62	1.64	2.47	0.5	2.15	3.98 ×	3.28 ×	1.15 ×
1×10^5	100	9.42	22.17	32.6	5.56	13.25	3.46 ×	3.99 ×	2.46 ×
1×10^6	500	185.2	289.11	389.7	113.16	154.86	2.10 ×	2.55 ×	2.52 ×
1×10^7	10000	1738.57	OOM	4556.77	OOM	1963.23	2.62 ×	OOM	2.32 ×

Table 3: Runtime comparison (in seconds) of our implementation vs *KeplerMapper* (KM) and *giotto-tda* (GT) on the *ImageNet*, *Cifar*, and *Random* datasets, respectively. **Int**: intervals. **OOM**: out of memory. **N/A**: not available. **KM/MI**, **GT/GT***, **KM/KM***: speed up factors.

Data Size	Intervals	CPU Version	GPU Version	CPU/GPU
ImageNet dataset				
1×10^2	5	0.12	0.05	2.40×
1×10^3	10	0.67	0.06	11.17×
1×10^4	20	2.54	0.80	3.18×
1×10^5	100	22.32	12.93	1.73×
3×10^5	500	69.88	36.22	1.93×
Cifar dataset				
1×10^2	5	0.042	3.95	0.01×
1×10^3	10	0.59	0.08	7.38×
1×10^4	20	2.17	0.53	4.09×
1×10^5	100	20.20	9.18	2.20×
1×10^6	500	331.58	202.87	1.63×
3×10^6	1500	1142.82	753.37	1.52×
Random dataset (128-dimension)				
1×10^2	5	0.05	3.97	0.01×
1×10^3	10	0.71	0.03	23.67×
1×10^4	20	2.21	0.36	6.14×
1×10^5	100	15.07	5.09	2.96×
1×10^6	500	256.36	122.64	2.09×
1×10^7	1500	5234.30	4269.83	1.23×

Table 4: Runtime comparison (in seconds) of our implementation on CPU vs GPU using three testing datasets. **CPU/GPU**: speed up factors.