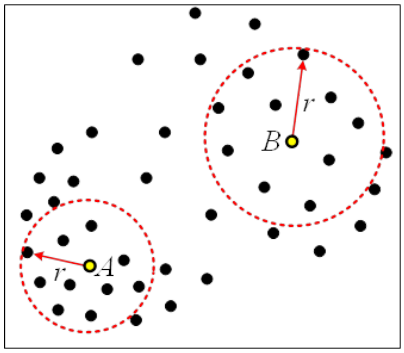

Fig. S1. The impact of different density distributions of clusters on the radius *r*.

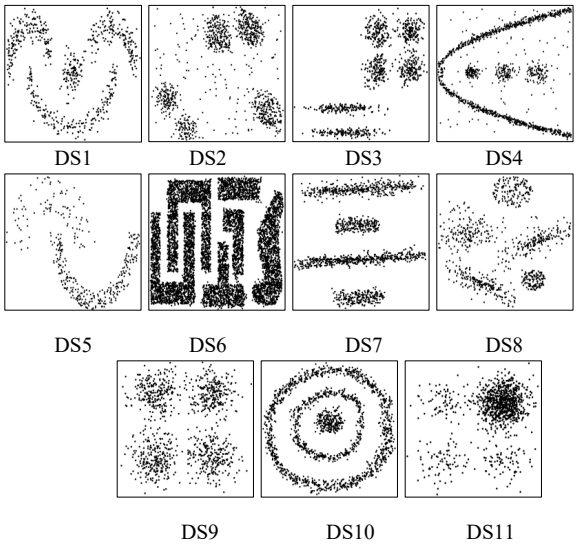

Fig. S2. 11 two-dimensional synthetic datasets.

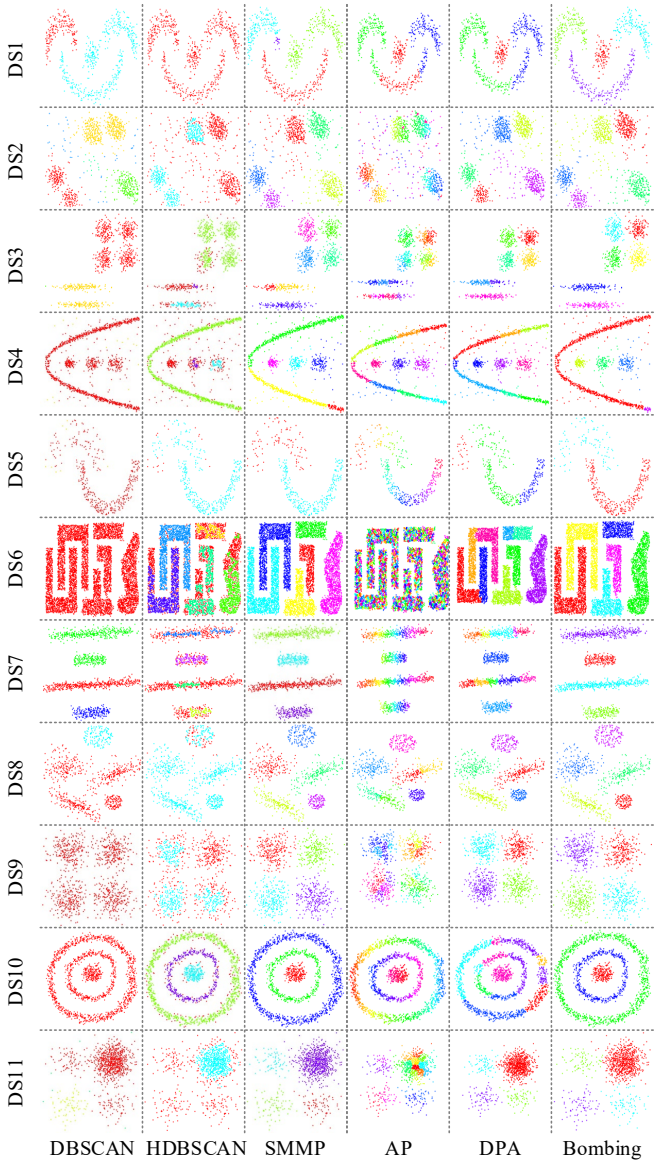

Fig. S3. Clustering results of 6 algorithms on 11 two-dimensional synthetic datasets under unknown K.

TABLE SI
CATEGORIES, PARAMETER SETTINGS AND TIME COMPLEXITY FOR BOMBING AND 11 COMPARED ALGORITHMS.

Algorithm	Categories	Parameters	Time complexity
DBSCAN	Density-based	*Epsilon*=0.1, *Minpts*=10	$O(N\log N)$
HDBSCAN	Density-based	-	$O(N^2)$
DPC-CE	Density-based	$T_r=0.25$, $P_r=0.3$	$O(N^2)$
GDD	Density-based	-	$O(N^2)$
CCIMST	Density-based	*dc*=0.2/0.02	$7O(n^2)$
SMMP	Density-based	$\eta=0.1$	$O(N\log N)$
DPA	Density-based	Z=5	$O(N^2)$
SMKNN	kNNG -based	k=10, $th_r=1$, $\sigma=\frac{1}{\sqrt{2}}$	$O(N^2)$
NTHC	KNN graph-based	k=10, $th_r=0.2$, $th_s=0.65$	$O(N^2)$
CTCEHC	Graph-based	-	$O(N^2)$
AP	Exemplar-based	*preference*=-50, *random_state*=0	$O(N^2I)$
Bombing	kNNG and density-based	k_1=2, k_2=10, *dc*=0.1, $\tau=0.6$, T_1=0.9, T_2=0.2	$O(N^2)$

TABLE SII
RUNTIME OF BOMBING ON 23 SYNTHETIC AND REAL DATASETS.

Dataset	Runtime(s)	Part 1&2	Part 3	$\frac{\text{Part 3}}{\text{Runtime}}$
DS1	0.015	0.014	0.001	7%
DS2	0.045	0.041	0.004	9%
DS3	0.023	0.020	0.003	13%
DS4	0.069	0.061	0.008	12%
DS5	0.010	0.009	0.001	10%
DS6	1.066	0.794	0.272	26%
DS7	0.062	0.056	0.006	10%
DS8	0.024	0.021	0.003	12%
DS9	0.039	0.035	0.004	10%
DS10	0.093	0.079	0.014	15%
DS11	0.051	0.046	0.005	10%
Abalone	0.120	0.107	0.013	11%
Glass	0.009	0.008	0.001	11%
Heart	0.007	0.006	0.001	14%
Ionosphere	0.008	0.007	0.001	12%
Page-blocks	1.795	1.615	0.180	10%
Seeds	0.021	0.02	0.001	5%
Sonar	0.008	0.007	0.001	12%
Vehicle	0.035	0.033	0.002	6%
Wpbc	0.014	0.013	0.001	7%
Yeast	0.252	0.214	0.038	15%
Alizadeh-2000-v2_database	0.006	0.005	0.001	17%
Lapointe-2004-v1_database	0.018	0.017	0.001	6%