1 ADDITIONAL EXPERIMENTS

1.1 EFFECT OF PRIVACY RADIUS ON MLDP-KDE

Table 1: MSEs of MLDP-KDE on each dataset when the privacy radius r is the maximum of the 10% percentile distance of a point to its neighbors, where the red font signify that the KDE distributions are significantly different from the exact ones due to perturbations.

Dataset	r	**MSE**		
		$\varepsilon = 1$	$\varepsilon = 5$	$\varepsilon = 20$
CodRNA	0.8494	0.0268	0.00174	0.000925
CovType	1.7803	0.0520	0.00853	0.001155
RCV1	0.8565	0.0131	0.00131	0.000759
Yelp	8.4035	0.0295	0.0154	0.010090
SYN	11.2314	0.00819	0.00377	0.00242

Table 2: MSEs of MLDP-KDE on each dataset by varying the privacy radius r as the average distance from a point to its t-nearest neighbors for $t \in \{1, 10, 100, 1000, 10000\}$ (rounded up to the nearest decimals of up to three digits). The red font also signify that the KDE distributions are significantly different from the exact ones due to perturbations according to heatmaps.

Datasets	t	r	**MSE**		
			$\varepsilon = 1$	$\varepsilon = 5$	$\varepsilon = 20$
CodRNA	1	0.01	0.0021	0.0006	0.0003
	10	0.055	0.0018	0.0007	0.00025
	100	0.1	0.0016	0.0009	0.0005
	1,000	0.15	0.0044	0.00095	0.0006
	10,000	0.2	0.0044	0.00142	0.0006
CovType	1	0.01	0.0003	0.0002	6e-05
	10	0.06	0.0003	0.0001	8e-05
	100	0.1	0.0023	0.0001	8e-05
	1,000	0.3	0.0065	0.0004	0.0001
	10,000	0.5	0.0144	0.0005	0.0001
RCV1	1	0.01	0.0008	0.0006	0.0002
	10	0.056	0.0013	0.0007	0.0002
	100	0.2	0.0058	0.0008	0.0006
	1,000	0.35	0.006	0.0008	0.0006
	10,000	0.5	0.022	0.0013	0.0007
Yelp	1	0.001	0.0008	0.00034	0.00018
	10	0.00175	0.0014	0.00038	7e-05
	100	0.0025	0.0016	0.00056	7e-05
	1,000	0.00375	0.0013	0.00041	8e-05
	10,000	0.005	0.0015	0.00073	0.0001
SYN	1	0.072	0.0034	0.00027	0.0004
	10	0.088	0.0036	0.00035	0.0001
	100	0.107	0.0037	0.0008	0.0001
	1,000	0.142	0.0036	0.0008	0.0001
	10,000	0.177	0.0037	0.0004	0.0001

1.2 UPDATED EXPERIMENTS WITH REVISED PRIVACY PARAMETER AND RADIUS

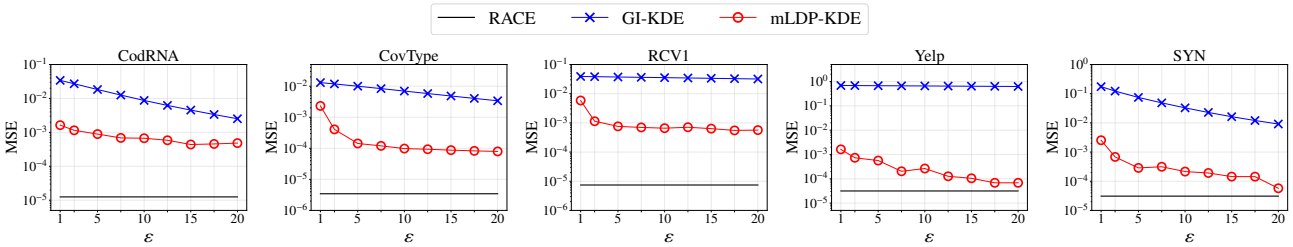

Figure 1: MSEs for KDE under mLDP with varying privacy budget $\varepsilon \in \{1, 2.5, 5, \ldots, 20\}$, where r is set to be the average distance from a point to its 100-nearest neighbors in each dataset.

1.3 HEATMAPS

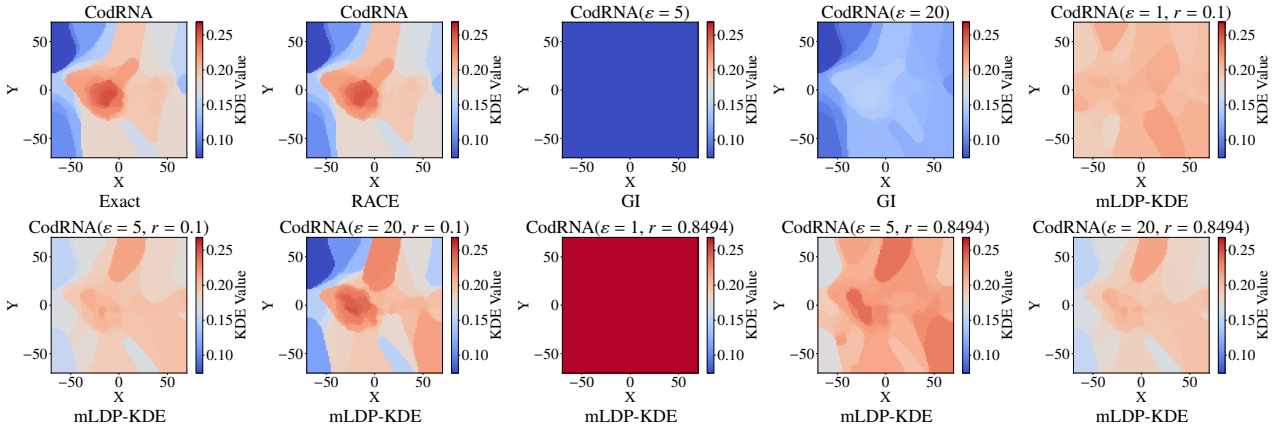

Figure 2: 2D Heatmaps for KDE on the CodRNA dataset, where t-SNE is used for dimensionality reduction.

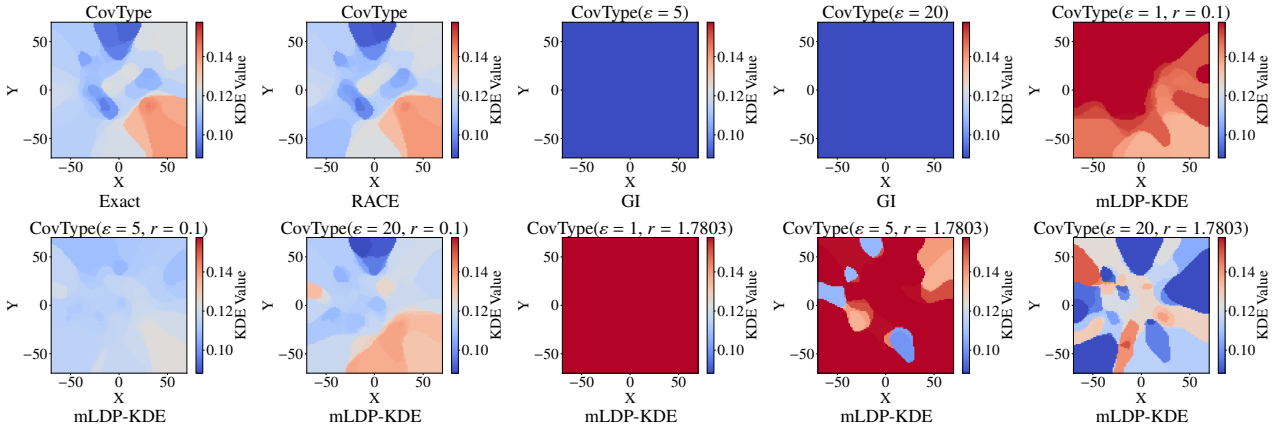

Figure 3: 2D Heatmaps for KDE on the CovType dataset, where t-SNE is used for dimensionality reduction.

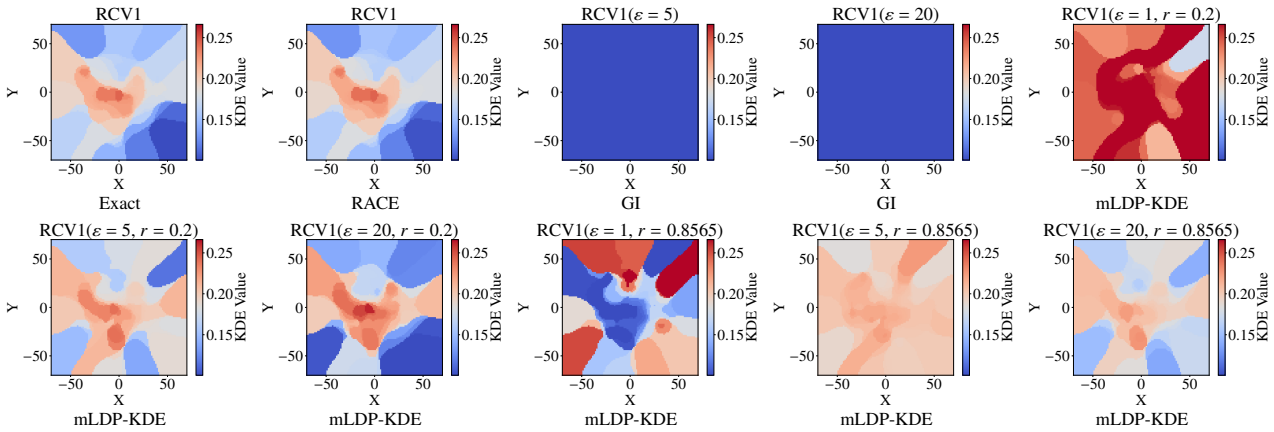

Figure 4: 2D Heatmaps for KDE on the RCV1 dataset, where t-SNE is used for dimensionality reduction.

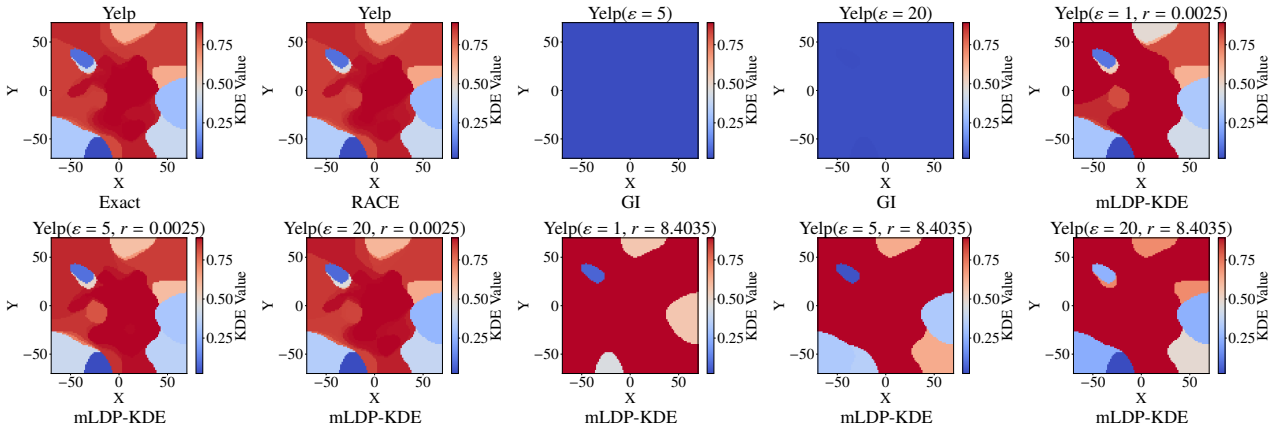

Figure 5: 2D Heatmaps for KDE on the Yelp dataset, where t-SNE is used for dimensionality reduction.

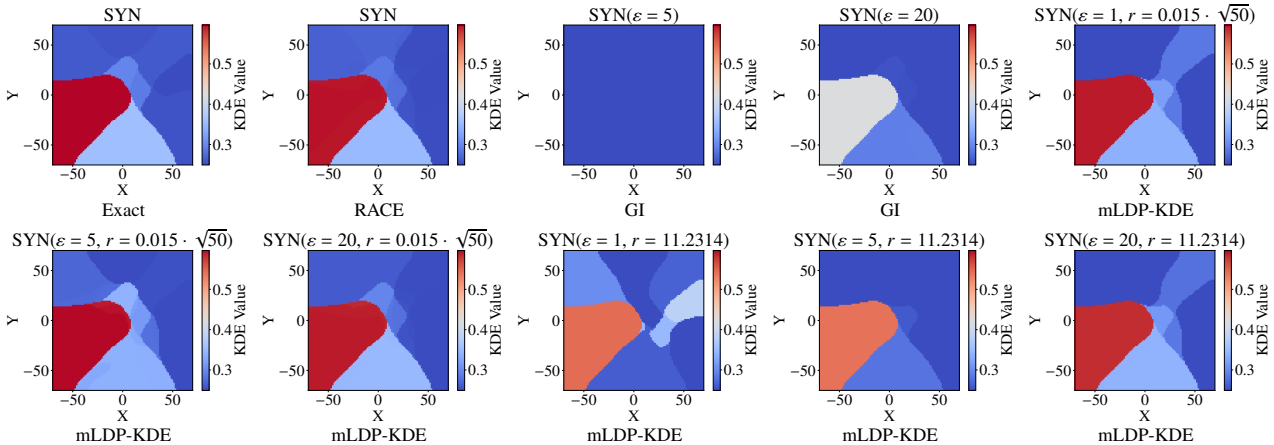

Figure 6: 2D Heatmaps for KDE on the SYN dataset, where t-SNE is used for dimensionality reduction.