

EmbedOR v. UMAP v. tSNE Comparisons

Table 1: Low energy expansion: permutation test results ($\alpha = 0.01$)

	$H_0 : \mu^{\text{UMAP}} = \mu^{\text{EmbedOR}}$	$H_0 : \mu^{\text{tSNE}} = \mu^{\text{EmbedOR}}$
	$H_1 : \mu^{\text{UMAP}} > \mu^{\text{EmbedOR}}$	$H_1 : \mu^{\text{tSNE}} > \mu^{\text{EmbedOR}}$
baron	✓	✗
camp	✓	✓
cifar10	✓	✓
klein	✓	✓
kang	✓	✗
kanton	✓	✗
paul	✗	✗
petropoulos	✓	✗
romanov	✓	✗
tsai	✓	✗
wagner	✓	✗
wikipedia	✓	✓
zeisel	✓	✗

Table 2: High energy contraction: permutation test results ($\alpha = 0.01$)

	$H_0 : \mu^{\text{UMAP}} = \mu^{\text{EmbedOR}}$	$H_0 : \mu^{\text{tSNE}} = \mu^{\text{EmbedOR}}$
	$H_1 : \mu^{\text{UMAP}} > \mu^{\text{EmbedOR}}$	$H_1 : \mu^{\text{tSNE}} > \mu^{\text{EmbedOR}}$
baron	✗	✗
camp	✓	✓
cifar10	✓	✓
klein	✓	✗
kang	✓	✓
kanton	✓	✓
paul	✗	✗
petropoulos	✓	✓
romanov	✓	✗
tsai	✓	✓
wagner	✗	✗
wikipedia	✓	✓
zeisel	✓	✗

Permutation test using 10,000 resamples and $\alpha = 0.01$. ✓ denotes rejection of the null hypothesis, while ✗ denotes failure to reject.