nature portfolio

https://doi.org/10.1038/s41592-022-01480-9

Supplementary information

Benchmarking spatial and single-cell transcriptomics integration methods for transcript distribution prediction and cell type deconvolution

In the format provided by the authors and unedited

a Method	Properties			b Accuracy	Scalability (min)	
				Adjust Per metric	Downsampled spots (cell*spot)	Downsampled cells (cell*spot)

Gene prediction

	Language	GPU	Methodology	PCC	SSIM	RMSE	JS	AS	RS	~6.5k*2.5k	~6.5k*5k	~6.5k*10k	~6.5k*20k	~3.2k*10k	~6.5k*10k	~13k*10k	~26k*10k
Tangram	Python	✓	deep learning							1.12	2.1	4.09	8.48	2.96	5.43	10.2	NA
gimVI	Python	✓	probabilistic model							17.7	18.3	25.2	43.5	20.2	23	34	NA
SpaGE	Python	×	joint embedding-based							21.9	46.8	99	195	41.9	83.9	208	366
Seurat	R	×	joint embedding-based							0.39	0.65	1.24	2.71	0.89	1.28	2.09	3.96
SpaOTsc	Python	×	optimal Transport							3.07	9.3	12.1	28.9	5.63	11.5	22.9	56.1
novoSpaRc	Python	×	optimal Transport							4.21	8.64	23.3	66.9	9.9	22.8	35.1	186
LIGER	R	×	joint embedding-based							1.02	1.7	2.4	3.89	2.04	2.37	2.98	4.67
stPlus	Python	✓	joint embedding-based							107	210	422	834	176	421	828	1819

Deconvolution

	Language	GPU	Methodology	~10k*2.5k	~10k*5k	~10k*10k	~10k*20k	~5k*2.5k	~10k*2.5k	~20k*2.5k	~40k*2.5k
Cell2location	Python	✓	probabilistic model	157	274	NA	NA	148	157	173	197
SpatialDWLS	R	×	weighted least squares	40.4	87.8	142	181	48.6	39.3	45.7	52.8
RCTD	R	×	probabilistic model	31.4	31.7	33.8	30.7	25.9	31.6	33.4	39.3
STRIDE	Python	×	topic model (LDA)	462	465	470	463	367	529	1029	2189
DestVI	Python	✓	probabilistic & deep learning	30.5	57.1	109	215	28.8	30.6	34.1	41.2
Stereoscope	Python	✓	probabilistic model	40.9	77.8	146	295	41.5	42	43.4	49.5
Tangram	Python	✓	deep learning	2.56	7.21	14.5	28.8	2.95	2.61	2.24	2.18
Seurat	R	×	joint embedding-based	2.94	3.97	4.7	4.3	2.66	3.05	4.3	6.87
SPOTlight	R	×	topic model (NMF)	513	538	541	538	427	523	708	910
DSTG	Python	✓	deep learning	37.4	41.6	56	172	21.4	40.4	70.8	138

Adjust Score

0 0.2 0.4 0.6 0.8 1