

Table S1. Error metrics and processing time of D1 (average of five repetitions)

Gap (%)	Band	MSLE		MSE		R2 (%)		Time (sec)	
		UL	BL	UL	BL	UL	BL	UL	BL
8.94	B01	0.000819	0.000721	76204.2	65855.2	57.22	63.03	178	341
	B02	0.001008	0.000842	105389.3	85515.1	78.58	82.62	100	338
	B03	0.001352	0.001119	141534.6	112977.9	84.93	87.97	157	658
	B04	0.001555	0.001165	254101.2	181961.8	94.42	96.00	34	332
	B05	0.002124	0.001608	327544.2	245814.7	90.44	92.83	53	456
	B07	0.002211	0.001782	233165.4	180367.1	85.69	88.93	121	936
14.23	B01	0.000882	0.000805	82988.0	74704.3	51.88	56.68	201	298
	B02	0.001	0.000925	104195.7	95455.5	77.88	79.74	113	163
	B03	0.001464	0.001385	154078.3	144699.0	82.85	83.90	185	66
	B04	0.001705	0.001541	271552.2	247710.4	93.86	94.39	39	43
	B05	0.002375	0.002015	362255.4	308092.6	89.07	90.70	60	50
	B07	0.002371	0.002066	252298.0	217271.4	83.95	86.18	130	237

Table S2. Error metrics and processing time of D2 (average of five repetitions)

Gap (%)	Band	MSLE		MSE		R2 (%)		Time (sec)	
		UL	BL	UL	BL	UL	BL	UL	BL
11.8	B01	0.00408388	0.00282207	438362.9	304642.5	10.23	37.61	122	368
	B02	0.00786246	0.00484686	923924.2	563198.6	34.59	60.13	75	447
	B03	0.01369394	0.00695814	1610000.0	794513.2	41.01	70.86	106	515
	B04	0.02405667	0.01131483	3500000.0	1710000.0	68.26	84.47	65	177
	B05	0.02414083	0.01330129	3700000.0	2030000.0	59.59	77.88	73	178
	B07	0.01851584	0.00900992	2230000.0	1070000.0	49.36	75.82	96	765
15.94	B01	0.00099419	0.00086711	92926.8	80212.2	58.91	64.53	355	665
	B02	0.00123904	0.00106356	132173.1	110927.5	78.47	81.93	236	593
	B03	0.00203394	0.00154383	221056.0	162511.9	80.49	85.66	350	833
	B04	0.00211432	0.00152794	352861.6	249824.6	93.93	95.70	88	662
	B05	0.00331425	0.0023106	515155.9	358848.4	87.81	91.51	183	1057
	B07	0.00319392	0.0023426	370347.7	261378.5	81.12	86.68	735	1772
27.26	B01	0.00337517	0.00258382	354265.0	263746.2	16.42	37.78	302	840
	B02	0.00626113	0.00454973	729560.5	520219.5	39.77	57.05	203	849
	B03	0.01054103	0.00752295	1210000.0	835046.3	47.19	63.47	300	1216
	B04	0.0254916	0.01283721	3720000.0	2110000.0	64.05	79.61	189	1792
	B05	0.03406127	0.01654293	4520000.0	2470000.0	43.76	69.30	230	1001
	B07	0.02109735	0.01182978	2290000.0	1360000.0	38.68	63.58	677	2374
34.76	B01	0.0048496	0.00454749	489521.6	463896.7	-11.60	-5.76	142	389
	B02	0.01403606	0.01426889	1430000.0	1440000.0	-19.20	-20.65	126	612
	B03	0.02869966	0.02901253	2790000.0	2810000.0	-21.67	-22.65	226	856
	B04	0.11638039	0.11762196	14000000.0	14100000.0	-31.63	-32.57	105	713
	B05	0.09016637	0.08992681	10300000.0	10300000.0	-26.35	-26.12	275	1523
	B07	0.04923798	0.04976622	4740000.0	4780000.0	-25.10	-26.12	594	3079

Table S3. Error metrics and processing time of D3 (average of five repetitions)

Gap (%)	Band	MSLE		MSE		R2 (%)		Time (sec)	
		UL	BL	UL	BL	UL	BL	UL	BL
12.48	B02	0.12255339	0.12046098	84651.5	83527.6	58.73	59.28	54	283
	B03	0.13037915	0.1192476	101999.6	92811.5	60.74	64.28	41	171
	B04	0.37745961	0.33745031	145443.6	130830.6	66.12	69.53	42	195
	B05	0.45251313	0.3319863	157000.4	131759.6	67.43	72.67	36	88
	B06	0.81401126	0.64194433	235030.1	221400.4	58.93	61.32	39	94
	B07	0.80937093	0.62268271	329637.0	202164.1	45.45	66.55	41	99
	B08	0.6986143	0.80180359	347466.6	352265.1	51.09	50.41	61	138
	B8A	1.53073598	0.86830152	459092.8	187566.5	30.34	71.54	51	135
	B11	1.16725258	0.88220655	313275.8	285225.6	55.73	59.69	62	150
	B12	1.00409943	0.93166344	149632.8	154193.3	73.09	72.27	57	137
18.57	B02	0.02865261	0.02318632	20625.7	17426.5	73.60	77.69	49	480
	B03	0.03428543	0.02915849	24473.3	20223.9	76.13	80.28	43	243
	B04	0.09771529	0.07266438	30085.2	23572.1	82.90	86.60	47	137
	B05	0.11577821	0.07698958	31263.6	21802.5	85.00	89.54	40	88
	B06	0.23693326	0.16810123	45614.8	31461.5	79.44	85.82	48	101
	B07	0.2115908	0.14893551	48854.6	34057.2	78.93	85.31	52	96
	B08	0.22764618	0.15987096	57426.9	40823.7	78.70	84.85	62	138
	B8A	0.39111144	0.32696565	57735.5	43309.2	76.45	82.33	64	117
	B11	0.42115833	0.33654145	48063.5	37482.9	79.99	84.39	71	99
	B12	0.42030276	0.35286849	32924.2	24067.3	82.35	87.10	61	89
26.63	B02	0.02080259	0.01570133	14274.0	11325.2	58.25	66.88	73	200
	B03	0.02318745	0.01733353	17833.1	12842.4	63.05	73.39	62	151
	B04	0.08218288	0.06765997	27619.7	20553.1	69.02	76.94	64	137
	B05	0.10162893	0.07893393	25247.5	20405.7	76.75	81.21	47	97
	B06	0.17374126	0.15383257	30935.3	24595.9	74.74	79.91	54	119
	B07	0.15049793	0.13299809	31358.4	24591.0	76.00	81.18	56	127
	B08	0.16361742	0.12567968	41283.1	28430.0	74.10	82.16	83	168
	B8A	0.21258734	0.18751088	33033.1	26363.2	76.97	81.62	63	129
	B11	0.19272303	0.15143081	36983.0	25514.1	74.42	82.35	72	113
	B12	0.19791659	0.16169831	25909.2	18562.2	74.50	81.73	69	115
31.07	B02	0.02447128	0.01870346	16209.9	12080.2	61.03	70.96	94	275
	B03	0.02848402	0.02208853	20376.6	16145.8	63.43	71.02	82	212
	B04	0.09039569	0.07338365	32866.5	25266.8	67.05	74.67	68	121
	B05	0.11218274	0.09305779	37784.6	29066.7	68.99	76.14	49	77
	B06	0.20470885	0.16323703	50264.6	37746.9	63.14	72.32	53	93
	B07	0.19070901	0.1489223	53452.8	40726.6	63.48	72.17	52	96
	B08	0.1840667	0.13774009	61137.3	41704.9	65.97	76.79	79	139
	B8A	0.28898118	0.22703591	58761.9	41821.4	63.52	74.04	63	118
	B11	0.26695263	0.20596638	55804.4	41635.7	62.03	71.67	84	145
	B12	0.27023218	0.21495287	40147.4	29472.5	59.49	70.26	81	157

Table S4. Reduction in processing time (%) when applying a targeted search for the best replicate in D1

		n2			
Gap %	Band	50	100	150	200
8.94	B01	43.13	60.33	80.29	86.38
	B02	56.38	69.68	72.87	81.12
	B03	37.03	45.9	59.42	62.08
	B04	56.84	61.05	71.58	80.53
	B05	46.08	54.9	60.29	60.78
	B07	28.81	37.29	39.55	41.81
14.23	B01	44.46	61.56	70.36	78.66
	B02	57.24	71.27	74.89	82.13
	B03	39.32	47.83	61.63	63.71
	B04	61.24	66.03	73.68	81.34
	B05	44.69	59.29	64.16	64.16
	B07	30.3	41.87	46.31	46.31

n2: Number of groups into which the KPs of the TI will be divided; (UL algorithm).

Table S5. Reduction in processing time (%) when applying a targeted search for the best replicate in D2

		n2			
Gap %	Band	50	100	150	200
11.8	B01	62.95	77.6	82.03	87.56
	B02	78.39	86.65	90.04	91.1
	B03	68.99	78.59	84.44	85.66
	B04	82.75	88.35	89.86	88.96
	B05	82.2	84.92	85.73	85.19
	B07	65.16	75.38	80.11	79.78
15.94	B01	46.54	62.02	69.81	78.19
	B02	55.71	67.43	70.17	80.52
	B03	40.93	53.36	61.29	70.63
	B04	57.41	61.88	65.12	74.69
	B05	44.02	50.36	52.03	51.91
	B07	34.4	41.95	42.64	41.95
27.26	B01	55.74	72.02	79.33	86.25
	B02	68.32	80.58	83.24	88.76
	B03	56.28	68.37	75.01	81.74
	B04	75.19	80.78	86.37	83.54
	B05	58.96	65.11	68.52	68.81
	B07	51.49	60.93	60.04	60.26

34.76	B01	75.33	89.61	92.07	93.76
	B02	75.37	84.52	88.72	92.17
	B03	60.97	75.14	81.89	86.43
	B04	39.96	65.83	68.34	76.45
	B05	16.63	25.54	39.01	44.75
	B07	43.41	39.08	40.41	44.12

Table S6. Reduction in processing time (%) when applying a targeted search for the best replicate in D3

Gap %	Band	n2			
		50	100	150	200
9.29	B02	73.51	83.9	88.1	89.15
	B03	82.7	90.49	92.49	93.92
	B04	91.39	94.29	95.56	95.92
	B05	94.25	96.55	96.74	97.79
	B06	92.59	94.49	95.79	96.29
	B07	92.46	94.42	95.49	96.47
	B08	89.44	93.31	93.99	94.96
	B8A	91.75	95.55	96.4	96.78
	B11	89.11	93.4	93.73	94.06
	B12	88.44	93.25	92.93	95.18
12.48	B02	82.47	89.03	91.72	93.31
	B03	88.34	93.02	94.73	95.78
	B04	88.86	92.89	94.21	94.91
	B05	89.38	94.1	95.18	96.17
	B06	89.29	93.39	94.51	96
	B07	88.97	91.52	94.06	95.23
	B08	88.34	91.02	91.55	93.69
	B8A	88.03	90.64	92.82	94.67
	B11	80.56	90.68	89.08	90.95
	B12	84.16	91.06	93.49	93.49
18.57	B02	63.93	76.87	82.15	84.52
	B03	70.44	82.06	85.74	88.68
	B04	75.92	86.45	87.46	89.8
	B05	85.23	87.64	90.69	92.62
	B06	79.68	87.63	87.81	90.64
	B07	80.76	86.15	88.67	88.67
	B08	78.04	87.31	86.79	88.16
	B8A	74.15	84.53	84.32	85.38
	B11	68	76.75	83	82.5
	B12	70.8	83.7	82.97	86.62
22.66	B02	62.43	75.34	81.7	84.01

	B03	76.78	86.2	88.52	90.85
	B04	84.77	89.97	90.1	90.76
	B05	87.96	87.82	91.98	93.46
	B06	83.28	90.54	88.01	92.11
	B07	86.89	91.13	91.39	93.32
	B08	81.92	87.89	85.74	89.22
	B8A	82.76	88.41	89	89.6
	B11	81.45	84.52	89.19	87.42
	B12	80.93	89.22	88.23	90.71
26.63	B02	52.53	64.4	70.68	76.44
	B03	59.44	71.83	77.71	81.73
	B04	67.21	79.82	81.62	85.23
	B05	80.04	83.75	87.28	89.58
	B06	74.22	79.37	84.53	87.85
	B07	74.11	79.36	84.43	87.24
	B08	65.83	76.88	79.17	80.63
	B8A	66.33	79.36	82.36	85.17
	B11	63.04	75.96	80.95	82.31
	B12	64.94	79.87	79.87	84.42
31.07	B02	63.28	74.14	81.38	84.57
	B03	70.46	80.19	84.75	87.64
	B04	76.73	85.25	87.33	89.29
	B05	85.76	90.09	91.69	93.05
	B06	83.07	86.07	89.8	91.12
	B07	84.43	86.67	88.79	91.16
	B08	74.31	82.68	84.85	87.16
	B8A	77.62	83.38	87.57	90.18
	B11	66.89	78.44	83.02	85.06
	B12	68.31	80.34	81.53	85.08
38.43	B02	86.74	93.62	95.54	96.33
	B03	92.24	96.12	97.3	97.77
	B04	92.85	95.93	96.93	96.96
	B05	94.39	96.77	97.79	97.45
	B06	93.5	95.93	97.05	97.38
	B07	94.57	96.04	96.79	97.46
	B08	89.41	91.21	92.83	93.32
	B8A	88.79	90.69	93.82	94.23
	B11	82.84	89.24	91.8	91.72
	B12	84.73	91.2	89.82	92.49

Table S7. Overall accuracy (%) when imposing a conditional filling path in D1

Gap %	Band	minNx			
		Benchmark	2	4	6
8.94	B01	56.62	57.1	57.51	56.36
	B02	77.78	78.26	78.65	79.19
	B03	84.5	84.81	84.9	84.99
	B04	93.82	94.21	94.44	94.7
	B05	89.48	90.2	90.43	90.37
	B07	84.88	85.26	85.65	86.21
14.23	B01	48.79	51.1	52.15	52.74
	B02	73.71	77.02	77.88	78.5
	B03	79.27	81.33	82.85	82.29
	B04	91.99	93.44	93.94	94.07
	B05	87.61	88.95	89.1	89.36
	B07	82.16	83.68	83.89	83.8

minNx: minimum number of known neighbors to be enforced for a selected UP;
(UL algorithm).

Table S8. Overall accuracy (%) when imposing a conditional filling path in D2

Gap %	Band	minNx			
		Benchmark	2	4	6
11.8	B01	-17.78	-1.32	10.68	5.48
	B02	-10.65	22.23	34.72	27.42
	B03	-4.95	34.6	41.09	39.19
	B04	-7.41	67.07	68.23	68.43
	B05	-5.93	50.88	59.88	55.99
	B07	-6.87	47.46	49.13	52.73
15.94	B01	35.93	57.54	58.94	58.04
	B02	54.03	77.83	78.53	78.27
	B03	59.16	79.41	80.66	81.47
	B04	70.01	93.71	93.95	94.35
	B05	64.52	87.67	87.83	88.12
	B07	59.97	80.91	81.11	81.01
27.26	B01	-3.16	18.85	14.44	12.84
	B02	0.43	42.54	43.4	38.23
	B03	0.67	49.1	47.2	46.7
	B04	-6.74	61.35	64.01	64.03
	B05	-5.3	47.39	43.87	44.55
	B07	-4.5	40.8	38.82	38.74
34.76	B01	-27.7	-12.94	-12.69	-10.01
	B02	-30.52	-18.69	-19.51	-17.81
	B03	-26.67	-22.84	-20.79	-22.3
	B04	-33.56	-31.86	-29.97	-29.46

	B05	-28.09	-26.34	-25.4	-26.41
	B07	-25.52	-25.99	-25.42	-24.62

minNx: minimum number of known neighbors to be enforced for a selected UP;
(UL algorithm).

Table S9. Overall accuracy (%) when imposing a conditional filling path in D3

Gap %	Band	minNx			
		Benchmark	2	4	6
9.29	B02	25.63	59.62	62.57	67.28
	B03	15.52	50.26	47.79	54.76
	B04	-6.17	45.37	57.84	58.01
	B05	-34.4	17.71	23.86	24.1
	B06	-24.43	-70.45	-48.81	-27.56
	B07	-34.47	-97.63	-84.35	-48.5
	B08	-30.6	-83.31	-63.81	-5.52
	B8A	-31.5	-116.8	-117.01	-88.9
	B11	-37.97	-74.99	-87.4	-25.43
	B12	-31.44	-52.85	-71.48	-40.56
12.48	B02	-3.2	60.36	59.33	56.96
	B03	-7.35	56.88	60.61	45.67
	B04	-13.43	64.13	65.86	58.19
	B05	-18.25	61.91	68.23	66.07
	B06	-20.11	44.77	58.69	46.33
	B07	-22.13	38.58	45.45	41.17
	B08	-22.85	24.38	37.37	37.37
	B8A	-25.1	31.09	27.61	45.94
	B11	-19.44	46.56	56.11	47.82
	B12	-15.12	62.69	74.28	57.47
18.57	B02	30.28	77.36	73.38	67.43
	B03	23.57	79.55	75.95	70.5
	B04	10.21	84.77	83.24	78.13
	B05	-2.61	86.17	85.16	81.55
	B06	-23.41	80.29	80.72	75.53
	B07	-30.93	79.58	78.68	77.45
	B08	-38.59	79.19	80.14	71.68
	B8A	-50.14	76.63	76.39	72.39
	B11	-43.27	80.31	80.16	81.14
	B12	-16.04	83.29	82.35	84.89
22.66	B02	-181.09	23.05	46.02	47.3
	B03	-159.17	24.81	43.63	45.42
	B04	-129.62	64.47	70.7	62.6
	B05	-121.73	62.56	68.8	64.91
	B06	-135.24	47.34	51.31	59.37

	B07	-136.78	46.6	53.49	52.82
	B08	-127.78	49.53	51.28	58.8
	B8A	-135.11	41.9	46.17	51.52
	B11	-145.75	40.26	28.59	36.5
	B12	-148.38	42.79	45.5	27.11
26.63	B02	-6.91	59.19	59.24	60.88
	B03	-14.16	62.51	63.93	65.2
	B04	-28.32	66.36	69.18	71.03
	B05	-42.5	75.61	76.96	77.97
	B06	-65.88	73.88	74.62	76.64
	B07	-70.86	73.86	76.32	77.03
	B08	-73.25	70.1	73.93	75.11
	B8A	-81.54	74.46	76.59	75.26
	B11	-77.46	72.48	74.33	73.98
	B12	-69.87	72.44	74.5	71.3
31.07	B02	-9	59.01	61.26	62.06
	B03	-16.26	58.94	63.43	64.72
	B04	-31.2	63.35	67.28	66.97
	B05	-45.55	67.3	68.9	73.8
	B06	-67.05	62.37	62.6	66.58
	B07	-74.54	63.6	62.83	66.76
	B08	-76.73	63.32	66.21	68.27
	B8A	-81.43	62.1	63.38	65.94
	B11	-95.16	61.7	62.22	63.3
	B12	-92.6	58.88	59.7	59.55
38.43	B02	-21.96	7.16	32.13	-11.02
	B03	-28.19	11.84	22.44	-13.97
	B04	-39.12	27.27	24.06	-6.68
	B05	-53.05	-11.2	-22.07	-11.66
	B06	-69.98	-11.32	-19.79	-9.32
	B07	-76.31	-26.43	-85.66	-143.08
	B08	-82.3	-17.52	-55.86	-79.37
	B8A	-87.77	-51.66	-92.97	-69.34
	B11	-80.67	10.02	-40.5	-9.96
	B12	-64.56	17.66	-27.04	-71.92

minNx: minimum number of known neighbors to be enforced for a selected UP; (UL algorithm).