

Supplementary material for inferring network properties based on the epidemic prevalence

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1 Inferring network metrics given the network type

Metric	Mean absolute error (MAE)		Mean squared error (MSE)	
	Treatment group	Control group	Treatment group	Control group
$E[D]$	0.381	1.34	0.239	2.69
$E[D^2]$	4.79	17.5	38.7	4.67×10^2
λ_1	0.372	1.31	0.219	2.55
$E[H]$	0.201	0.435	6.46×10^{-2}	0.297
$E[1/H]$	1.90×10^{-2}	3.73×10^{-2}	5.74×10^{-4}	2.17×10^{-3}
d_{max}	1.46	2.50	3.71	9.95
C_G	6.54×10^{-3}	8.31×10^{-3}	7.46×10^{-5}	1.12×10^{-4}
μ_{N-1}	0.177	0.312	6.54×10^{-2}	0.173
ρ_D	3.44×10^{-2}	3.46×10^{-2}	1.82×10^{-3}	1.89×10^{-3}
N	95.0	1.00×10^2	1.39×10^4	1.53×10^4

Table 1: MAE and MSE of different network metrics when the benchmark networks are ER networks. The effective infection rate is set as $\tau = 1$ and the initial state $y_0 = 0.2$. The mean errors are obtained by averaging over 1000 ER benchmark networks.

Metric	Mean absolute error (MAE)		Mean squared error (MSE)	
	Treatment group	Control group	Treatment group	Control group
$E[D]$	0.434	1.36	0.458	2.97
$E[D^2]$	0.757	16.2	13.1	4.95×10^2
λ_1	9.12×10^{-2}	1.41	7.34×10^{-2}	3.50
$E[H]$	0.190	0.627	6.03×10^{-2}	0.625
$E[1/H]$	1.63×10^{-2}	4.62×10^{-2}	4.51×10^{-4}	3.32×10^{-3}
d_{max}	1.05	2.45	2.01	9.35
C_G	1.89×10^{-2}	2.35×10^{-2}	6.58×10^{-4}	9.60×10^{-4}
μ_{N-1}	8.63×10^{-2}	0.629	2.24×10^{-2}	0.703
ρ_D	3.42×10^{-2}	4.06×10^{-2}	1.88×10^{-3}	2.61×10^{-3}
N	91.2	1.04×10^2	1.31×10^4	1.59×10^4

Table 2: MAE and MSE of different network metrics when the benchmark networks are WS networks. The parameter settings are the same as Tab. 1.

Metric	Mean absolute error (MAE)		Mean squared error (MSE)	
	Treatment group	Control group	Treatment group	Control group
$E[D]$	3.60×10^{-2}	1.44	7.19×10^{-2}	3.72
$E[D^2]$	6.57	31.9	85.3	1.62×10^3
λ_1	0.820	2.36	1.09	8.46
$E[H]$	0.123	0.332	2.55×10^{-2}	0.177
$E[1/H]$	1.49×10^{-2}	3.44×10^{-2}	3.69×10^{-4}	1.83×10^{-3}
d_{max}	13.6	15.1	3.08×10^2	3.69×10^2
C_G	1.84×10^{-2}	1.98×10^{-2}	5.75×10^{-4}	6.15×10^{-4}
μ_{N-1}	9.14×10^{-2}	0.551	4.27×10^{-2}	0.520
ρ_D	2.39×10^{-2}	3.16×10^{-2}	9.53×10^{-4}	1.55×10^{-3}
N	97.3	1.01×10^2	1.47×10^4	1.55×10^4

Table 3: MAE and MSE of different network metrics when the benchmark networks are BA networks. The parameter settings are the same as Tab. 1.

Metric	Mean absolute error (MAE)		Mean squared error (MSE)	
	Treatment group	Control group	Treatment group	Control group
$E[D]$	0.151	0.300	0.216	2.86
$E[D^2]$	17.9	35.2	5.37×10^2	1.88×10^3
λ_1	1.83	2.73	5.17	11.2
$E[H]$	2.38×10^{-2}	0.137	3.61×10^{-2}	0.141
$E[1/H]$	1.70×10^{-2}	2.92×10^{-2}	4.51×10^{-4}	1.32×10^{-3}
d_{max}	18.7	23.6	5.46×10^2	8.52×10^2
C_G	2.34×10^{-2}	2.71×10^{-2}	8.57×10^{-4}	1.17×10^{-3}
μ_{N-1}	0.124	0.173	2.60×10^{-2}	4.90×10^{-2}
ρ_D	2.74×10^{-2}	3.02×10^{-2}	1.19×10^{-3}	1.42×10^{-3}
N	94.6	1.02×10^2	1.37×10^4	1.56×10^4

Table 4: MAE and MSE of different network metrics when the benchmark networks are SF networks. The parameter settings are the same as Tab. 1.