e-companion to **Xie et al.**:

Influence Minimization via Blocking Strategies

EC. 1 Detailed results of comparison with the exact Algorithm.

We demonstrate that the expected spread of the GR algorithm and the results of the Exact algorithm in both the TR Model (Tables R1) and the WC Model (Table R2).

Table R1: Exact v.s. GreedyReplace (IC & TR model)

b	Expected Spread			Running Time (s)		Expected Spread			Running Time (s)	
	Exact	GR	Ratio	Exact	GR	Exact	GR	Ratio	Exact	GR
	Panel A: IMIN Problem (TR Model)					Panel B: IMIN-EB Problem (TR Model)				
1	12.614	12.614	100%	3.07	0.12	10.873	10.873	100%	3.04	0.10
2	12.328	12.334	99.95%	130.91	0.21	10.652	10.655	99.9%	150.72	0.31
3	12.112	12.119	99.94%	3828.2	0.25	10.454	10.459	99.9%	5373.9	0.35
4	11.889	11.903	99.88%	80050	0.33	10.360	10.407	99.5%	90897	0.40

Table R2: Exact v.s. GreedyReplace (IC & WC model)

b	Expected Spread			Running Time (s)		Expected Spread			Running Time (s)	
	Exact	GR	Ratio	Exact	GR	Exact	GR	Ratio	Exact	GR
	Panel C: IMIN Problem (WC Model)					Panel D: IMIN-EB Problem (WC Model)				
1	11.185	11.185	100%	2.63	0.10	11.882	11.882	100%	4.03	0.12
2	11.077	11.078	99.99%	110.92	0.18	11.634	11.697	99.5%	205.21	0.25
3	10.997	10.998	99.99%	3284.0	0.23	11.344	11.421	99.3%	7375.2	0.37
4	10.922	10.925	99.97%	69415	0.33	11.269	11.279	99.9%	98247	0.50

EC. 2 Detailed results of comparison with other heuristics.

We compare the effectiveness (i.e., expected spread) of our proposed algorithms (AG and GR) with other heuristics (RA, OD and GS) on all networks (EC, F, W, EA, D, T, S, Y) under the IC model using pairwise t-tests in Tables R3 (IMIN problem) and Table R4 (IMIN-EB problem). The results under the LT model are included in the Tables R5 and R6.

Table R3: Expected Spread in the IMIN problem (IC model)

b	EmailCore (TR model)					Facebook (TR model)					Wiki-Vote (TR model)					EmailAll (TR model)				
	RA	OD	GS	AG	GR	RA	OD	GS	AG	GR	RA	OD	GS	AG	GR	RA	OD	GS	AG	GR
20	354.88***	230.10***	223.45**	220.59**	**219.69**	16.059***	16.026***	12.134**	11.717*	**11.691**	512.62***	325.51***	135.935***	131.30*	**130.77**	548.99***	286.05***	14.925***	14.642**	**13.640**
40	341.33***	98.712***	85.193***	84.022*	**83.823**	16.037***	16.019***	10.509*	10.416*	**10.413**	512.18***	222.00***	45.931***	46.747***	**43.898**	546.94***	221.97***	10.310*	10.319*	**10.002**
60	325.13***	47.249***	35.092**	35.085**	**33.634**	16.033***	16.010***	10.151*	10.151*	**10.149**	507.11***	138.60***	25.013***	25.514***	**23.282**	546.39***	148.52***	10.003*	10	10
80	304.90***	30.277***	18.996*	19.001*	**18.848**	15.997***	15.987***	10.031*	10.028*	**10.026**	501.49***	32.646***	17.398*	17.332*	**17.322**	545.41***	100.84***	10	10	10
100	283.54***	22.696***	13.595*	13.640*	**13.533**	15.994***	15.980***	10.003*	10.001	10.001	496.05***	25.831***	14.720*	14.726*	**14.518**	544.59***	55.398***	10	10	10

b	DBLP (TR model)					Twitter (TR model)					Stanford (TR model)					Youtube (TR model)				
	RA	OD	GS	AG	GR	RA	OD	GS	AG	GR	RA	OD	GS	AG	GR	RA	OD	GS	AG	GR
20	13.747***	13.730***	10.508*	10.502*	**10.499**	16,801***	16,610***	16,103**	16,101*	**16,100**	16.087***	16.075***	11.872***	12.069***	**10.483**	14.774***	14.762***	13.431***	14.743***	**10.950**
40	13.739***	13.725***	10.084*	10.079	10.079	16,796***	16,470***	15,749**	15,749**	**15,748**	16.080***	16.071***	10.493*	10.488*	**10.234**	14.773***	14.755***	10.009*	10.075*	**10.002**
60	13.737***	13.721***	10.014*	10.012*	**10.010**	16,786***	16,329***	15,015***	15,447***	**14,972**	16.071***	16.040***	10.115*	10.136*	**10.075**	14.773***	14.750***	10	10	10
80	13.720***	13.714***	10	10	10	16,780***	16,175***	14,524***	14,610***	**14,474**	16.064***	16.017***	10.022*	10.026*	**10.019**	14.767***	14.742***	10	10	10
100	13.716***	13.706***	10	10	10	16,771***	16,057***	13,439***	13,619***	**13,181**	16.052***	15.989***	10.008*	10.009*	**10.002**	14.762***	14.729***	10	10	10

Notes. Best performers are bold. All experiments are repeated five times.

$^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.001$.

Table R4: Expected Spread in the IMIN-EB problem (IC model)

b	EmailCore (TR model)					Facebook (TR model)					Wiki-Vote (TR model)					EmailAll (TR model)				
	RA	OD	GS	AG	GR	RA	OD	GS	AG	GR	RA	OD	GS	AG	GR	RA	OD	GS	AG	GR
20	364.62***	364.42***	362.652**	361.54*	**361.51**	57.846***	58.04***	33.349*	33.346*	**33.279**	484.60***	487.94***	167.17**	167.93**	**166.79**	1,567.0***	1566.2***	354.67***	361.51***	**338.46**
40	364.53***	364.36***	356.98*	357.15*	**356.48**	57.829***	57.829***	23.751*	23.748*	**23.702**	481.22***	482.27***	41.025**	42.768**	**40.205**	1,561.9***	1564.1 ***	82.792***	83.462***	**81.488**
60	364.42***	364.23***	335.16***	336.62***	**333.41**	57.669***	57.579***	18.907*	18.901*	**18.859**	480.61***	482.20***	16.991*	17.329**	**16.311**	1,556.6***	1561.0***	25.204**	28.143***	**23.414**
80	364.30***	364.10***	275.15***	281.97***	**267.79**	57.568***	57.363***	15.631*	15.624*	**15.611**	479.28***	475.20***	11.489*	11.491*	**11.360**	1,556.6***	1558.2***	13.049**	14.049**	**12.954**
100	364.12***	363.81***	197.25***	206.65***	**189.50**	57.322***	57.316***	13.329	13.330*	13.329	475.67***	472.55***	10.097*	10.101*	**10.086**	1,551.9***	1550.7***	11.628*	11.783*	**11.590**

b	DBLP (TR model)					Twitter (TR model)					Stanford (TR model)					Youtube (TR model)				
	RA	OD	GS	AG	GR	RA	OD	GS	AG	GR	RA	OD	GS	AG	GR	RA	OD	GS	AG	GR
20	10.690**	10.692***	10.448*	10.451*	**10.354**	16,800***	16,800***	16,703**	16,701**	**16,697**	13.477***	13.456***	11.294***	11.540***	**10.989**	10.819**	10.817**	10.079*	10.081*	**10.069**
40	10.686**	10.688**	10.251*	10.253*	**10.144**	16,800***	16,799***	16,662***	16,760***	**16,607**	13.471***	13.439***	10.503*	10.512*	**10.487**	10.803**	10.817**	10.030*	10.031*	**10.025**
60	10.684*	10.687**	10.048*	10.055*	**10.037**	16,799***	16,799***	16,581***	16,588***	**16,567**	13.503***	13.460***	10.205*	10.232*	**10.105**	10.801**	10.814**	10.008*	10.006*	**10.005**
80	10.682**	10.685**	10.021*	10.023*	**10.015**	16,799***	16,797***	15,991***	16,552***	**15,650**	13.469***	13.555***	10.067*	10.097*	**10.011**	10.800**	10.804***	10.001	10.002*	10.001
100	10.673**	10.669**	10.013*	10.016*	**10.004**	16,796***	16,797***	13,628***	16,486***	**11,479**	13.518***	13.453***	10.012*	10.040*	**10**	10.797**	10.790**	10	10	10

Notes. Best performers are bold. All experiments are repeated five times.

$^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.001$.

Table R5: Comparision with Other Heuristics (Expected Spread) in IMIN problem (LT model)

b	EmailCore (WC model)			Facebook (WC model)			Wiki-Vote (WC model)			EmailAll (WC model)		
	RA	OD	AG	RA	OD	AG	RA	OD	AG	RA	OD	AG
20	111.63***	74.122**	**72.291**	29.741***	29.289***	**17.841**	30.751***	28.610***	**20.87**	16.109***	13.015***	**11.743**
40	94.271***	61.501***	**49.055**	28.911***	28.978***	**14.041**	30.076***	27.910***	**18.658**	15.867***	12.738***	**10.66**
60	93.424***	47.736***	**41.895**	28.492***	26.821***	**11.869**	29.139***	25.914***	**15.749**	15.791***	12.147***	**10**
80	84.402***	41.032***	**31.894**	28.116***	26.468***	**11.85**	28.407***	15.064***	**11.113**	15.689***	12.111**	**10**
100	77.613***	33.140***	**30.217**	26.818***	26.061***	**10.423**	27.474***	13.757***	**10.744**	15.349***	12.066**	**10**
b	DBLP (WC model)			Twitter (WC model)			Stanford (WC model)			Youtube (WC model)		
	RA	OD	AG	RA	OD	AG	RA	OD	AG	RA	OD	AG
20	164.57***	164.65***	**39.367**	350.20***	327.51***	**265.73**	28.027***	27.809***	**12.866**	28.121***	27.375***	**10.835**
40	162.24***	159.38***	**23.893**	348.53***	308.57***	**212.88**	27.971***	27.379***	**11.301**	27.710***	26.572***	**10.058**
60	161.07***	148.66***	**12.517**	347.07***	271.03***	**194.46**	26.882***	26.833***	**10.680**	26.921***	26.057***	**10**
80	145.60***	147.03***	**10**	335.84***	262.19***	**166.57**	26.614***	26.319***	**10.101**	26.190***	25.956***	**10**
100	143.88***	144.71***	**10**	321.43***	254.65***	**158.14**	26.386***	25.983***	**10.076**	26.101***	25.409***	**10**

Notes. Since the LT model requires the probabilities of incoming edges for each node to be equal to or less than 1, we choose to evaluate our algorithms exclusively under the WC model.

Best performers are bold. All experiments are repeated five times.

**$p < 0.05$; ***$p < 0.001$.

Table R6: Comparision with Other Heuristics (Expected Spread) in IMIN-EB problem (LT model)

b	EmailCore (WC model)			Facebook (WC model)			Wiki-Vote (WC model)			EmailAll (WC model)		
	RA	OD	AG	RA	OD	AG	RA	OD	AG	RA	OD	AG
20	150.71***	140.09***	**129.69**	53.284***	55.036***	**28.192**	22.971***	22.527***	**18.445**	157.48***	151.63***	**116.66**
40	149.65***	139.04***	**114.99**	50.290***	53.601***	**23.228**	22.562***	20.732***	**15.708**	155.84***	151.33***	**108.58**
60	139.11***	136.82***	**110.73**	49.761***	50.569***	**21.943**	20.840***	20.499***	**13.642**	153.81***	149.71***	**88.054**
80	136.26***	135.74***	**96.138**	49.173***	50.370***	**20.212**	20.424***	20.420***	**11.509**	142.38***	143.98***	**59.450**
100	133.45***	132.10***	**89.610**	48.574***	48.089***	**19.159**	20.415***	20.379***	**11.016****	138.71***	135.55***	**43.745**
b	DBLP (WC model)			Twitter (WC model)			Stanford (WC model)			Youtube (WC model)		
	RA	OD	AG	RA	OD	AG	RA	OD	AG	RA	OD	AG
20	16.479***	16.249***	**13.582**	228.32***	224.13***	**211.76**	32.991***	32.914***	**16.977**	39.883***	39.188***	**28.027**
40	16.288***	16.145***	**13.353**	225.67***	218.33***	**194.24**	32.597***	32.071***	**14.491**	39.217***	39.182***	**21.656**
60	15.766***	15.928***	**13.173**	216.97***	213.86***	**191.15**	32.446***	32.068***	**12.745**	39.067***	38.839***	**16.904**
80	15.651***	15.491***	**12.024**	209.50 ***	208.04***	**178.17**	32.129***	31.920***	**11.588**	38.591***	37.354***	**10.868**
100	15.305***	14.824***	**11.700**	200.55***	199.60***	**176.21**	30.733***	30.664***	**10.543**	37.379***	36.745***	**10**

Notes. Since the LT model requires the probabilities of incoming edges for each node to be equal to or less than 1, we choose to evaluate our algorithms exclusively under the WC model.

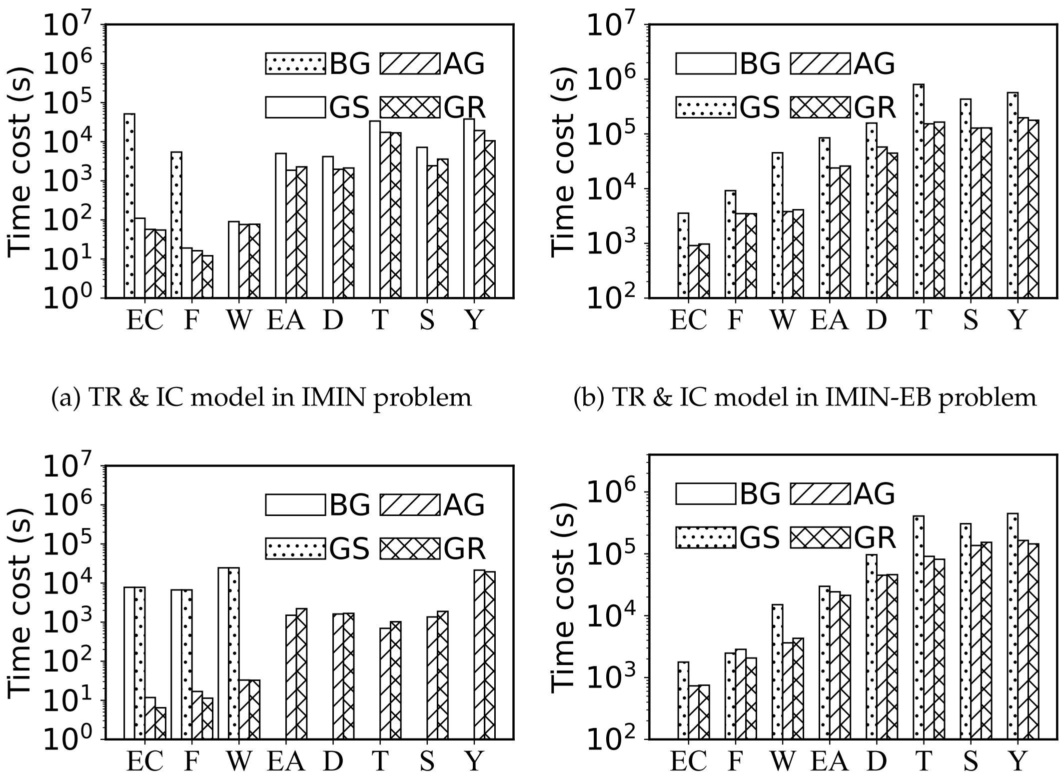
Best performers are bold. All experiments are repeated five times.

***$p < 0.001$.

EC. 3 Detailed results of time cost of algorithms.

Figures R1 and R2 show the results for all networks under the two propagation models where the x-axis denotes different networks and the y-axis is the running times (s) of the algorithms.

Figure R1: Time Cost of Different Algorithms



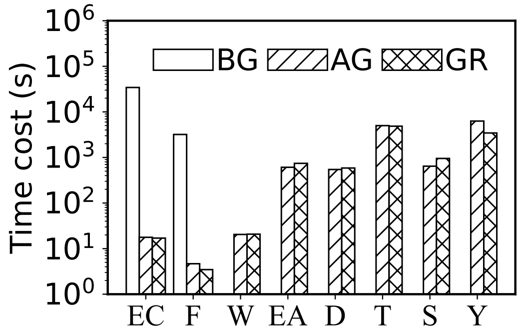
(a) TR & IC model in IMIN problem

(b) TR & IC model in IMIN-EB problem

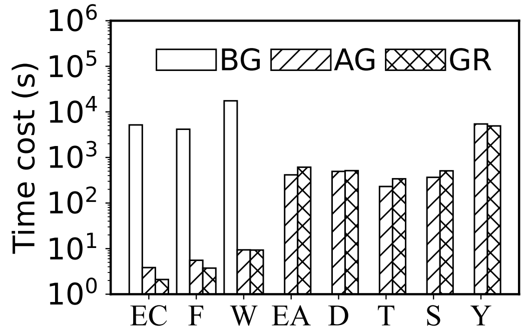
(c) WC & IC model in IMIN problem

(d) WC & IC model in IMIN-EB problem

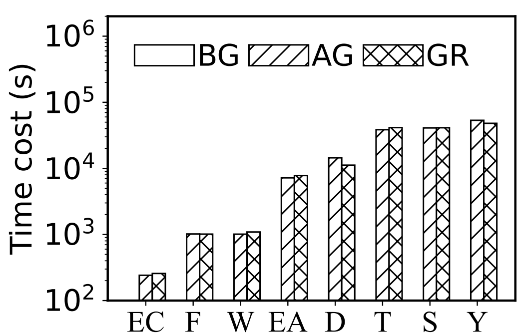
Figure R2: Time Cost of Different Algorithms



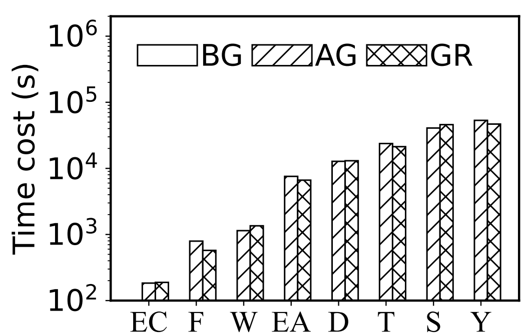
(a) TR & LT model in IMIN problem



(b) WC & LT model in IMIN problem



(c) TR & LT model in IMIN-EB problem

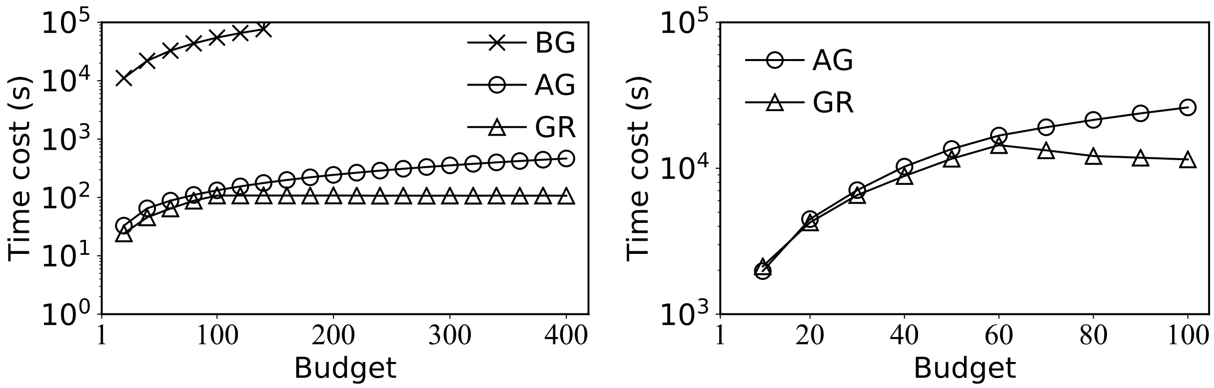


(d) WC & LT model in IMIN-EB problem

EC. 4 Detailed results of varying the budget.

The running time of the algorithms on `Facebook` and `DBLP` networks are shown in Figures R3 and R4 for various budgets.

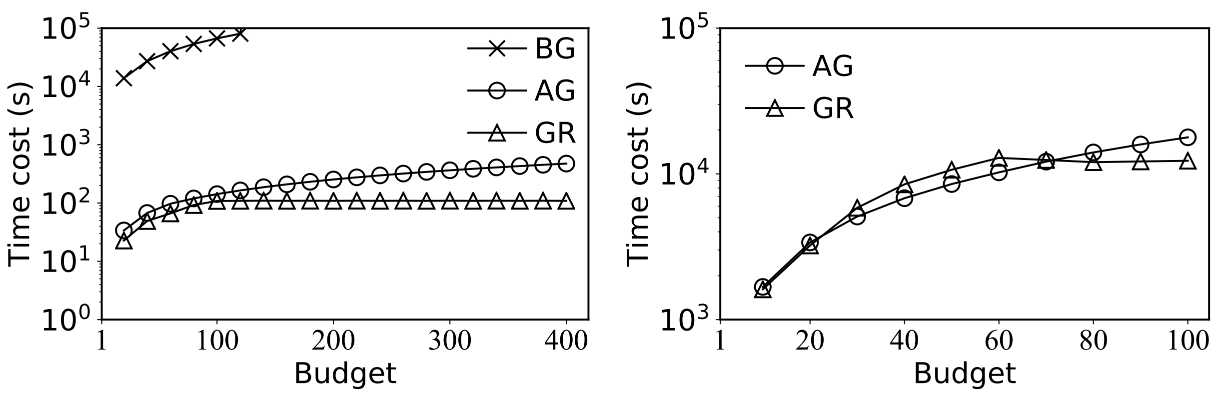
Figure R3: Running Time v.s. Budget in the IMIN problem



(a) TR & IC model in `Facebook` dataset

(b) TR & IC model in `DBLP` dataset

Figure R4: Running Time v.s. Budget in the IMIN problem



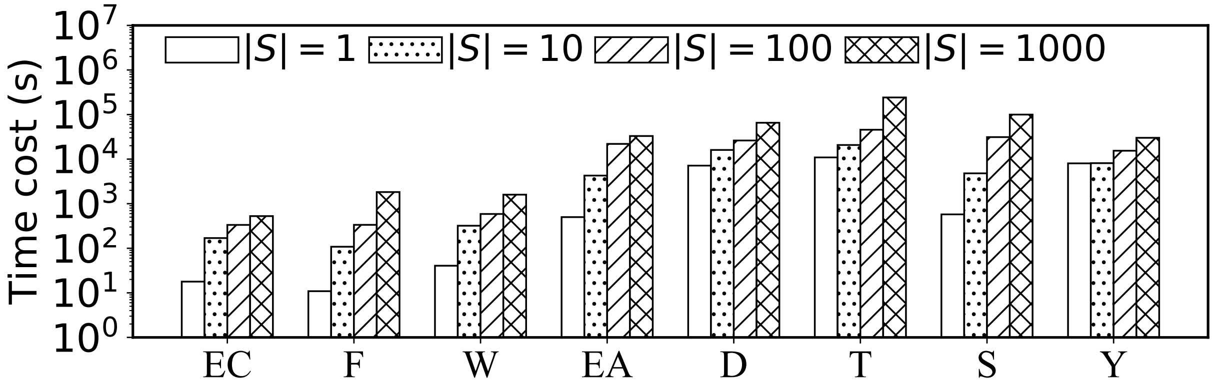
(a) WC & IC model in `Facebook` dataset

(b) WC & IC model in `DBLP` dataset

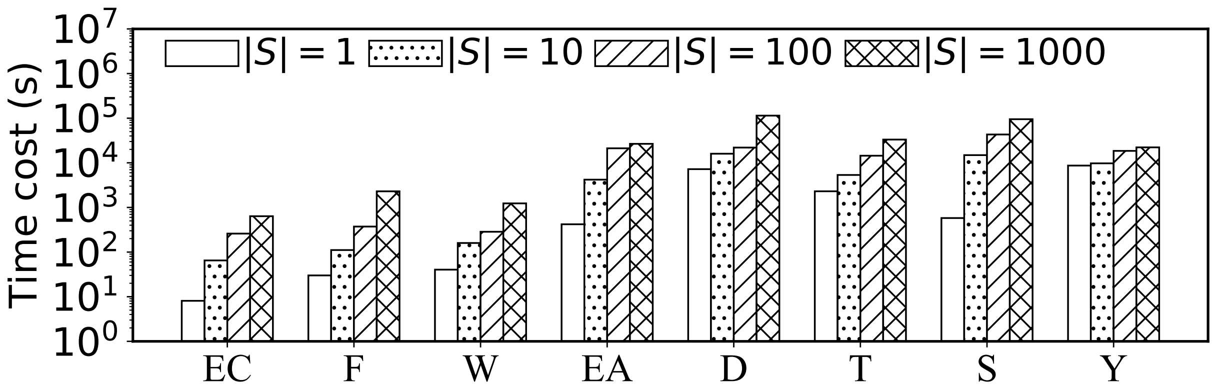
EC. 5 Detailed results of scalability study.

The scalability of our GR algorithm is assessed in Figures R5a and R5b.

Figure R5: Running Time v.s. Number of Seeds (IMIN problem under the IC model)



(a) TR Model

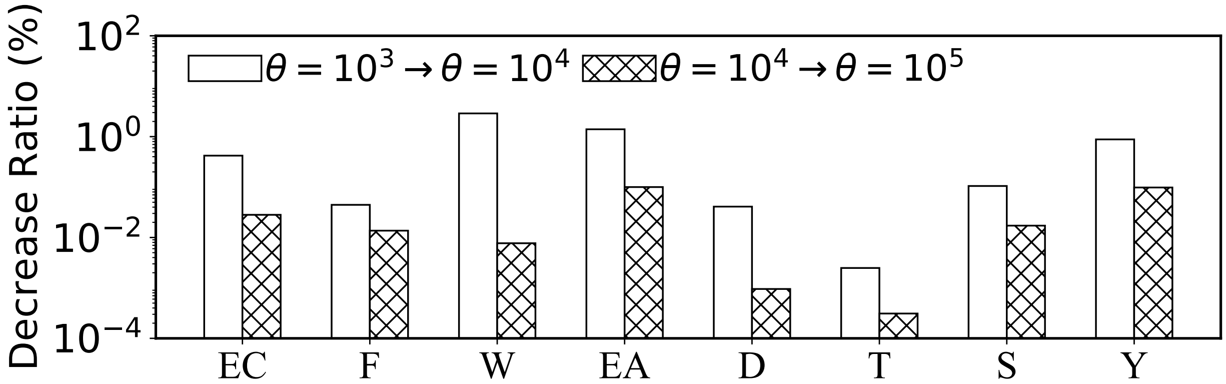


(b) WC Model

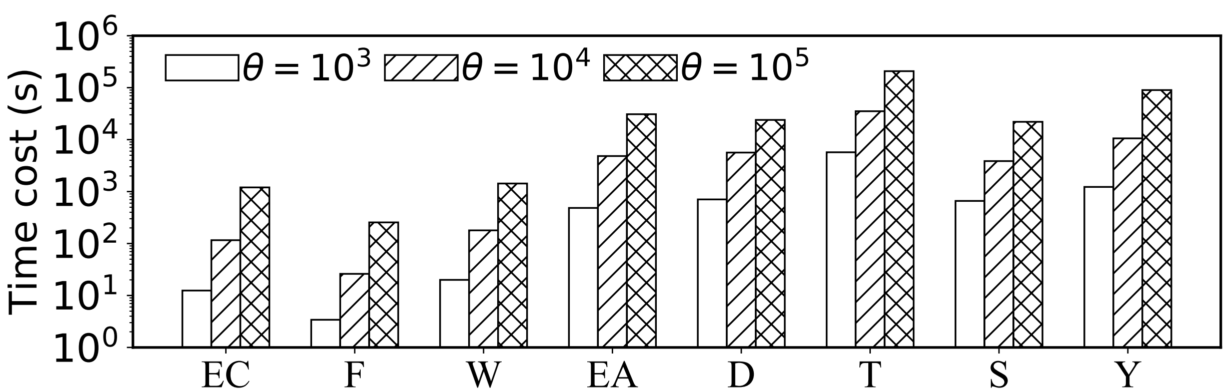
EC. 6 Detailed results of study of θ selection.

In Figure R6a and Figure R6b, we vary θ from 10^3, 10^4 to 10^5, and report the expected spread and running time of our GR algorithm.

Figure R6: Time Cost of Different Algorithms for the IMIN problem under the IC model



(a) Expected Spread v.s. #Sampled Graphs



(b) Running Time v.s. Number of Sampled Graphs