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Supplemental Information

**Integrated Value of Influence: An Integrative
Method for the Identification of the Most
Influential Nodes within Networks**

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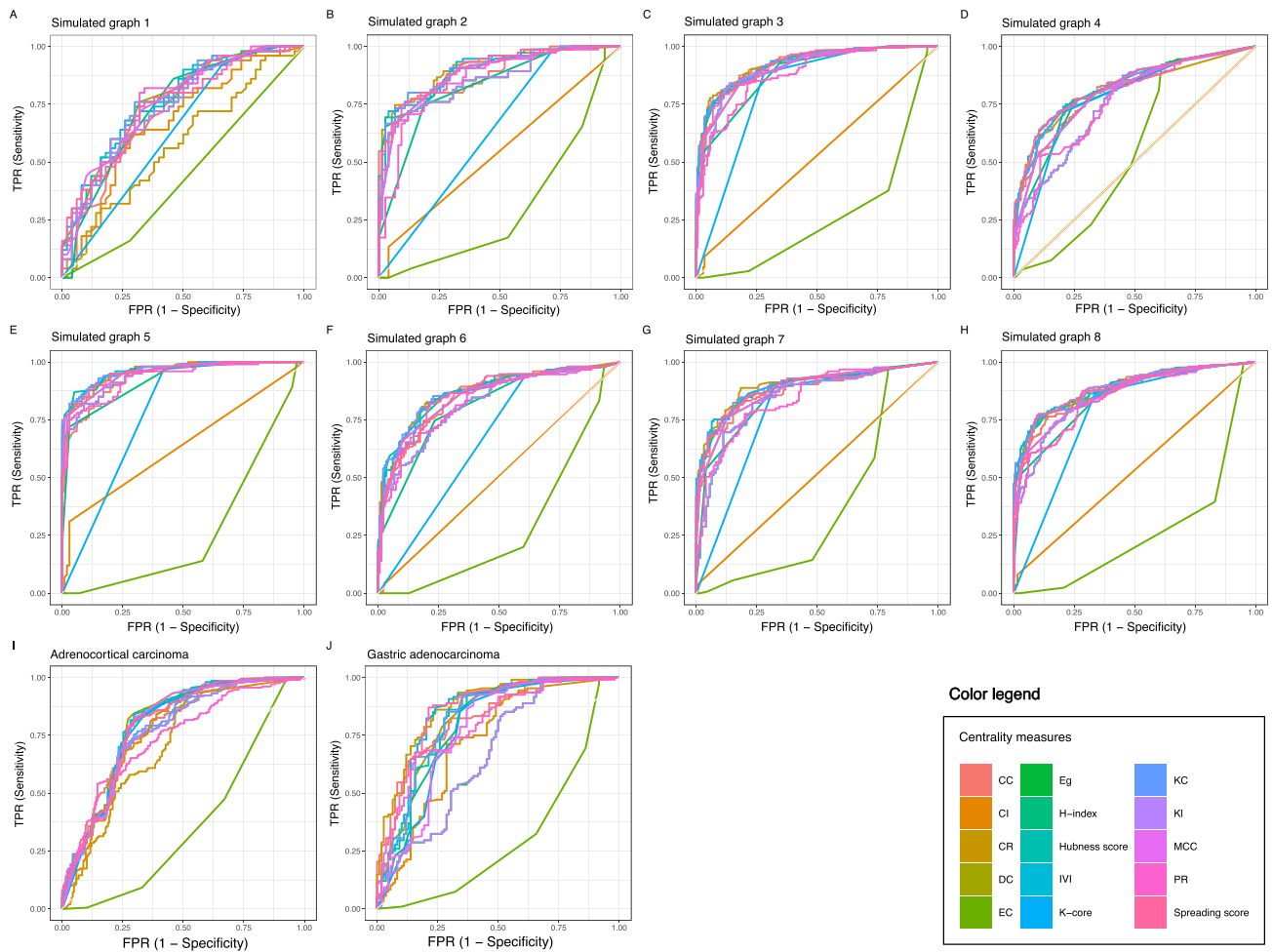


Figure S1. Performance of IVI in comparison with 14 other current methods in practice. Related to Figure 6.

A-J. The receiver operating characteristics (ROC) plots of the performance of 15 different methods in identification of true influential nodes across 10 networks including eight randomly simulated (A-H) and two biological ones (I and J). The biological networks include a protein-protein interaction network of adrenocortical carcinoma (I) and a miRNA co-expression network of gastric adenocarcinoma (J). The extended form of abbreviations used in the figure are as follows; TPR: true positive rate, FPR: false positive rate, IVI: integrated value of influence, DC: degree centrality, KI: Kleinberg's hub centrality score, CR: ClusterRank, Cl: collective influence, PR: PageRank, CC: closeness centrality, Eg: eigenvector centrality, KC: Katz centrality, EC: Eccentricity centrality, MCC: maximal clique centrality.

Table S3. A table of all 10 networks including their source and basic characteristics used and investigated in this study for the evaluation of the performance of IVI in comparison with other methods.

Network name	Citation	# nodes	# edged
PPI network of adrenocortical carcinoma	PMID: 27422560	413	6605
miRNA co-expression in gastric adenocarcinoma	PMID: 30886771	216	948
Simulated graph 1	This paper	100	500
Simulated graph 2	This paper	150	235
Simulated graph 3	This paper	350	645
Simulated graph 4	This paper	400	379
Simulated graph 5	This paper	200	405
Simulated graph 6	This paper	300	465
Simulated graph 7	This paper	250	307
Simulated graph 8	This paper	500	935

Table S4. A table of key resources including the software packages used for statistical assessments and data visualization.

Reagent or Resource	Source	Identifier
Software and Algorithms		
R statistical software	R Core Team	https://www.r-project.org
igraph R package	Csardi & Nepusz, (2006)	https://cran.r-project.org/package=igraph
CANOVA R package	Wang et al, (2015)	https://github.com/liyistat/canova
Hmisc R package	Harrell Jr et al.	https://CRAN.R-project.org/package=Hmisc
NNS R package	Viola	https://cran.r-project.org/package=NNS
minerva R package	Albanese et al (2012)	https://cran.r-project.org/package=minerva
centiserve	Jalili (2017)	https://cran.r-project.org/package=centiserve
Rmisc R package	Hope	https://cran.r-project.org/package=Rmisc
mgcv R package	Wood et al, (2016)	https://CRAN.R-project.org/package=mgcv
influential R package	This paper	https://CRAN.R-project.org/package=influential
Cytoscape v3.7.1	Shannon et al, 2003	http://www.cytoscape.org
cytoHubba Cytoscape plugin	Chin et al, (2014)	http://apps.cytoscape.org/apps/cytohubba
ggplot2 R package	Wickham H, (2016)	https://cran.r-project.org/package=ggplot2
plotROC R package	Sachs (2017)	https://cran.r-project.org/package=plotROC
Other		
196 real-world networks	Index of Complex Networks (ICON)	https://icon.colorado.edu