Contents

Part I Vulnerability and Robustness

1 **Structural Vulnerability and Robustness in Complex Networks: Different Approaches and Relationships Between them** 3
Regino Criado and Miguel Romance

2 **Optimizing Network Topology for Cascade Resilience** 37
Alexander Gutfraind

3 **Optimizing Synchronization, Flow, and Robustness in Weighted Complex Networks** 61
G. Korniss, R. Huang, S. Sreenivasan, and B.K. Szymanski

4 **Joint Optimization of Resources and Routes for Minimum Resistance: From Communication Networks to Power Grids** 97
Ali Tizghadam, Alireza Bigdeli, Alberto Leon-Garcia, and Hassan Naser

5 **Clique Relaxation Models in Social Network Analysis** 143
Jeffrey Pattillo, Nataly Youssef, and Sergiy Butenko

Part II Complex Communication Networks

6 **Application Traffic Activity Graph Analysis** 165
Yu Jin, Esam Sharafuddin, and Zhi-Li Zhang

7 **Localized Bridging Centrality** 197
Soumendra Nanda and David Kotz

8 **On Throughput Maximization Problem for UWB-Based Sensor Networks via Reformulation–Linearization Technique** 219
Yi Shi, Y. Thomas Hou, and Hanif D. Sherali

9 A Parallel Routing Algorithm for Traffic Optimization 241
M.L. Wang, K.H. Yeung, and F. Yan

10 Internet Based Service Networks 263
LiYing Cui, Soundar Kumara, and Réka Albert

Part III Online Social Networks and Security

11 On Detection of Community Structure in Dynamic Social Networks 307
Nam P. Nguyen, Ying Xuan, and My T. Thai

12 Path Formation in Human Contact Networks 349
Nishanth Sastry and Pan Hui

13 Social Forwarding in Mobile Opportunistic Networks: A Case of PeopleRank 387
Abderrahmen Mtibaa, Martin May, and Mostafa Ammar

14 Discount Targeting in Online Social Networks Using Backpressure-Based Learning 427
Srinivas Shakkottai and Lei Ying

15 Social-Aware Data Diffusion in Delay Tolerant MANETs 457
Yang Zhang, Wei Gao, Guohong Cao, Tom La Porta, Bhaskar Krishnamachari, and Arun Iyengar

16 Security and Privacy in Online Social Networks: Optimization Perspectives 483
Ling Ding, Hongjie Du, and Weili Wu

17 A Social Network Based Patching Scheme for Worm Containment in Cellular Networks 505
Zhichao Zhu, Guohong Cao, Sencun Zhu, Supranamaya Ranjan, and Antonio Nucci

Index 535