

# Contents

## Part I Basic Theory and Properties

<b>1</b>	<b>Optimization in Designing Complex Communication Networks</b> .....	<b>3</b>
	Fernanda S.H. Souza, Geraldo R. Mateus, and Alexandre Salles da Cunha	
<b>2</b>	<b>Fitness-Based Generative Models for Power-Law Networks</b> .....	<b>39</b>
	Khanh Nguyen and Duc A. Tran	
<b>3</b>	<b>Double Pareto Lognormal Distributions in Complex Networks</b> .....	<b>55</b>
	Zheng Fang, Jie Wang, Benyuan Liu, and Weibo Gong	
<b>4</b>	<b>Laplacian Spectra and Synchronization Processes on Complex Networks</b> .....	<b>81</b>
	Juan Chen, Jun-an Lu, Choujun Zhan, and Guanrong Chen	
<b>5</b>	<b>Growing Networks Driven by the Evolutionary Prisoner's Dilemma Game</b> .....	<b>115</b>
	J. Ponceña, J. Gómez-Gardeñes, L.M. Floría, and Yamir Moreno	

## Part II Structure and Dynamics of Complex Networks

<b>6</b>	<b>Defining and Discovering Communities in Social Networks</b> .....	<b>139</b>
	Stephen Kelley, Mark Goldberg, Malik Magdon-Ismael, Konstantin Mertsalov, and Al Wallace	
<b>7</b>	<b>Modularity Maximization and Tree Clustering: Novel Ways to Determine Effective Geographic Borders</b> .....	<b>169</b>
	D. Grady, R. Brune, C. Thiemann, F. Theis, and D. Brockmann	
<b>8</b>	<b>Emergence and Structure of Cybercommunities</b> .....	<b>209</b>
	Marija Mitrović and Bosiljka Tadić	

<b>9</b>	<b><i>k</i>-Core Organization in Complex Networks</b> .....	229
	G.J. Baxter, S.N. Dorogovtsev, A.V. Goltsev, and J.F.F. Mendes	
 <b>Part III Complex Networks Optimization Techniques</b>		
<b>10</b>	<b>Hardness Complexity of Optimal Substructure Problems on Power-Law Graphs</b> .....	255
	Yilin Shen, Dung T. Nguyen, and My T. Thai	
<b>11</b>	<b>Path Problems in Complex Networks</b> .....	279
	Pavel Ghosh and Arun Sen	
<b>12</b>	<b>Optimized Design of Large-Scale Social Welfare Supporting Systems on Complex Networks</b> .....	337
	Jaroslav Janáček, Ľudmila Jánošíková, and Ľuboš Buzna	
<b>13</b>	<b>Optimal Flows in Dynamic Networks and Algorithms for their Finding</b> .....	363
	Maria Fonoberova	
<b>14</b>	<b>Some Distributed Approaches to the Service Facility Location Problem in Dynamic and Complex Networks</b> .....	405
	Ioannis Stavrakakis	
 <b>Part IV Applications</b>		
<b>15</b>	<b>Modeling Epidemic Spreading in Complex Networks: Concurrency and Traffic</b> .....	435
	Sandro Meloni, Alex Arenas, Sergio Gómez, Javier Borge-Holthoefer, and Yamir Moreno	
<b>16</b>	<b>Theory of Citing</b> .....	463
	M.V. Simkin and V.P. Roychowdhury	
<b>17</b>	<b>TTLed Random Walks for Collaborative Monitoring in Mobile and Social Networks</b> .....	507
	Yaniv Altshuler, Shlomi Dolev, and Yuval Elovici	
	<b>Index</b> .....	539

Handbook of Optimization in Complex Networks

Theory and Applications

Thai, M.T.; Pardalos, P. (Eds.)

2012, XIV, 546 p., Hardcover

ISBN: 978-1-4614-0753-9