

## Contents

Foreword	vii
Preface	ix
Acknowledgments	xi
Selected Data Mining Concepts JAMES ABELLO, GRAHAM CORMODE, DMITRIY FRADKIN, DAVID MADIGAN, OFER MELNIK, and ILYA MUCHNIK	1
Descriptive Epidemiology: A Brief Introduction DONA SCHNEIDER	41
Biostatistical Challenges in Molecular Data Analysis WILLIAM SHANNON	63
Mining Online Media for Global Disease Outbreak Monitoring LYNETTE HIRSCHMAN and LAURIE E. DAMIANOS	73
Generalized Contingency Tables and Concept Lattices DAVID OZONOFF, ALEX POGEL, and TIM HANNAN	93
Graph Partitions and Concept Lattices JAMES ABELLO and ALEX POGEL	115
Using Transmission Dynamics Models to Validate Vaccine Efficacy Measures Prior to Conducting HIV Vaccine Efficacy Trials KAMAL DESAI, MARIE-CLAUDE BOILY, BENOÎT MÂSSE, and ROY ANDERSON	139
Causal Tree of Disease Transmission and The Spreading of Infectious Diseases ALEXEI VÁZQUEZ	163
Structure of Social Contact Networks and Their Impact on Epidemics STEPHEN EUBANK, V. S. ANIL KUMAR, MADHAV MARATHE, ARAVIND SRINIVASAN, and NAN WANG	181
Random Graphs (and the Spread of Infections in a Social Network) JAMES ABELLO and MICHAEL CAPALBO	215
Attempting to Narrow the Integrality Gap for the Firefighter Problem on Trees STEPHEN HARTKE	225

Influences on Breast Cancer Survival via SVM Classification in the SEER Database	
JIXIN LI, ILYA MUCHNIK, and DONA SCHNEIDER	233
Validation of Epidemiological Models: Chicken Epidemiology in the UK	
DMITRIY FRADKIN, ILYA MUCHNIK, PATRICK HERMANS, and KENTON MORGAN	243
Index	257