

Alyson G. Wilson
Gregory D. Wilson
David H. Olwell
Editors

Statistical Methods in Counterterrorism

Game Theory, Modeling,
Syndromic Surveillance, and
Biometric Authentication

inger

Contents

Part I Game Theory

Game Theory in an Age of Terrorism: How Can Statisticians Contribute? <i>Ronald D. Pricker, Jr.</i>	3
Combining Game Theory and Risk Analysis in Counterterrorism: A Smallpox Example <i>David L. Banks. Steven Anderson.</i>	9
Game-Theoretic and Reliability Methods in Counterterrorism and Security <i>Vichi Bier.</i>	23

Part II Biometric Authentication

Biometric Authentication <i>David L. Banks.</i>	43
Towards Statistically Rigorous Biometric Authentication Using Facial Images <i>Sinjyvi Mitra.</i>	47
Recognition Problem of Biometrics: Nonparametric Dependence Measures and Aggregated Algorithms <i>Andrew L. Rukhin.</i>	81

Part III Syndromic Surveillance

**Data Analysis Research Issues and Emerging Public Health
Biosurveillance Directions**

Henry Rolka101

**Current and Potential Statistical Methods for Monitoring'
Multiple Data Streams for Biosurveillance**

Galit Shmueli, Stephen E. Fienberg 109

Evaluating Statistical Methods for Syndromic Surveillance

*Michael A. Stoto, Ronald D. Pricker, Jr., Arvind Jam. Alexis
Diamond; John O. Dames-Cole, Chevelle Glyrnph, Gebreyesus Kidane.
Garrett Lum, LaVerne Jones, Kerda Dehan, and Christine Yuan* 141

**A Spatiotemporal Analysis of Syndromic Data for
Biosurveillance**

Laura Forsberg, Caroline Jeffery, Al Ozonoff, Marcello Pagano 173

Part IV Modeling

Modeling and Simulation for Defense and National Security

Wendy L. Martinez 195

**Modeling and Parameterization for a Smallpox Simulation
Study**

Sarah Michalak, Gregory Wilson 199

**Approaches to Modeling the Concentration Field for Adaptive
Sampling of Contaminants during Site Decontamination**

*William K. Sieber, James S. Bennett, Abera Wouhib, Joe Fred
Gonzalez, Jr., Myron, J. Katzoff, Stanley A. Shulman* 215

Secure Statistical Analysis of Distributed Databases

Alan F. Karr, Xiaodong Lin, Ashish P. Sanil, Jerome P. Reiter 237

**Statistical Evaluation of the Impact of Background
Suppression on the Sensitivity of Passive Radiation Detectors**

Tom Burr, James Gattiker, Mark Mullen, George Tompkins 263

Index 281