Contents

Preface v

Soft Computing for Softgoods Supply Chain Analysis and Decision Support 1
S. Fang, H. Nuttle, R. King, and J. Wilson

1 Introduction 1

2 Supply Chain Modeling and Optimization 3

3 Due-Date Negotiation 10

4 Conclusion 13

5 Acknowledgement 14

6 References 14

Application of Fuzzy Set Theory in Mechanics of Composite Materials 16
A. Muc, P. Kedziora

1 Introduction 16

2 Foundations of Fuzzy Set Theory 20

3 The Vertex Method – Computational Analysis 31

4 Mechanical Properties of Composite Materials 32

5 Fuzzy Set Analysis of Limit Load Carrying Capacity 37

6 Optimization Problems in a Fuzzy Environment 42

7 Analysis of the Experimental Data 45

8 References 47

Soft Computing and Density Functional Theory in the Design of Safe Textile Chemicals 51
L. Sztandera, M. Trachtman, C. Bock, J. Velga, A. Garg

1 Introduction 51

2 Computational Methods 54

3 Neural Network Approach 64

4 Feed-Forward Neural Network Architecture 69

5 Azo Dye Database 70

6 Concluding Remarks 71

7 Acknowledgement 72

8 References 72

Neural-Fuzzy Systems for Color Classifications in Textiles 75
B. Xu

1 Automatic Color Classification in Printed Fabrics 75

2 Cotton Color Classification by Fuzzy Logic 84

3 References 94

Agent-Based Modeling of the Textile/Apparel Marketplace 96
E. Brannon, S. Thommesen, and T. Marshall

1 Agent-Based Modeling as a Method of Inquiry 96

2 Simulation for the Textile/Apparel Marketplace 103

3 InfoSUMERS: A Diffusion of Innovation Simulation 105

4 Virtual Consumer: Simulation of the Formation of Purchase Intent 110

5 Sphere of Influence: A Simulation of Supplier-Consumer Relationships 115

6 Relevance of Agent-Based Modeling to the Textile-Apparel Industry 118

7 Summary 119

8 Future Directions 120

9 References 121

Generating a Rule Set for the Fiber-to-Yarn Production Process by Means of an Efficiency-based Classifier System 124
S. Sette, L. Van Langenhove

1 Introduction Learning Classifier Systems 125

2 Efficiency Based Classifier Systems (ECS) 134

3 ECS-implementation for the Generation of Industrial Production Rules 142

4 Development/extension of ECS for Continuous Parameters 147

5 Conclusions 166

6 References 167

List of Contributors 169

About the Editors 170