Table of Contents

Preface ................................................................................................................................................ xiv

Acknowledgment ................................................................................................................................ xx

Chapter 1
Application of Soft-Computing Methods in Cellular Manufacturing ........................................... 1
Pranab K. Dan, West Bengal University of Technology, India
Tamal Ghosh, West Bengal University of Technology, India
Sourav Sengupta, West Bengal University of Technology, India

Chapter 2
Multi-Objective Optimization of Manufacturing Processes Using Evolutionary Algorithms ........ 44
M. Kanthababu, Anna University, India

Chapter 3
Self Control and Server-Supervisory Control for Multiple Mobile Robots, and its
Applicability to Intelligent DNC System .............................................................................................. 67
F. Nagata, Tokyo University of Science, Japan
T. Yamashiro, Tokyo University of Science, Japan
N. Kitahara, Tokyo University of Science, Japan
A. Otsuka, Tokyo University of Science, Japan
K. Watanabe, Okayama University, Japan
Maki K. Habib, The American University in Cairo, Egypt

Chapter 4
Online Machining Optimization with Continuous Learning ............................................................. 85
M. Chandrasekaran, North Eastern Regional Institute of Science and Technology, India
M. Muralidhar, North Eastern Regional Institute of Science and Technology, India
C. Murali Krishna, Maulana Azad National Institute of Technology, India
U.S. Dixit, Indian Institute of Technology Guwahati, India

Chapter 5
Computational Techniques in Statistical Analysis and Exploitation of CNC Machining
Experimental Data ................................................................................................................................... 111
N. A. Fountas, School of Pedagogical & Technological Education (ASPETE), Greece
A. A. Krimpenis, School of Pedagogical & Technological Education (ASPETE), Greece
N. M. Vaxevanidis, School of Pedagogical & Technological Education (ASPETE), Greece
Chapter 6
Application of Particle Swarm Optimization for Achieving Desired Surface Roughness in Tungsten-Copper Alloy Machining ................................................................. 144
V. N. Gaitonde, B. V. B. College of Engineering and Technology, Hubli, Karnataka, India
S. R. Karnik, B. V. B. College of Engineering and Technology, Hubli, Karnataka, India
J. Paulo Davim, University of Aveiro, Campus Santiago, Aveiro, Portugal

Chapter 7
Models and Optimization Techniques of Machining Parameters in Turning Operations .......... 162
Shutong Xie, Jimei University, China
Zidong Zhang, Jimei University, China

Chapter 8
Simulation of Grinding by Means of the Finite Element Method and Artificial Neural Networks ......................................................................................................................... 193
A.P. Markopoulos, Laboratory of Manufacturing Technology, National Technical University of Athens, Greece

Chapter 9
Application of Taguchi Method with Grey Fuzzy Logic for the Optimization of Machining Parameters in Machining Composites ......................................................... 219
K. Palanikumar, Sri Sairam Institute of Technology, India
B. Latha, Sri Sairam Engineering College, India
J. Paulo Davim, University of Aveiro, Portugal

Chapter 10
Taguchi, Fuzzy Logic and Grey Relational Analysis Based Optimization of ECSM Process during Micro Machining of E-Glass-Fibre-Epoxy Composite ........................................ 242
Alakesh Manna, PEC University of Technology, India

Chapter 11
Modeling and Optimization of Abrasive Water Jet Cutting of Kevlar Fiber-Reinforced Polymer Composites .............................................................................................................. 262
Tauseef Uddin Siddiqui, M.J.P. Rohilkhand University, India
Mukul Shukla, University of Johannesburg, South Africa and Motilal Nehru National Institute of Technology (MNNIT), India
Chapter 12
Developments in Finite Element Technology and Optimization Formulations for Sheet Metal Forming ................................................................. 287

Robertt A. F. Valente, University of Aveiro, Portugal
Ricardo J. Alves de Sousa, University of Aveiro, Portugal
António Andrade-Campos, University of Aveiro, Portugal
Raquel de-Carvalho, University of Aveiro, Portugal
Marisa P. Henriques, University of Aveiro, Portugal
José I. V. Sena, University of Aveiro, Portugal
João F. Caseiro, University of Aveiro, Portugal

Chapter 13
Joining Sheets to Tubular Profiles by Tube Forming .................................................. 319

Luis M. M. Alves, Instituto Superior Tecnico, Technical University of Lisbon, Portugal
Paulo A. F. Martins, Instituto Superior Tecnico, Technical University of Lisbon, Portugal

Chapter 14
Modeling and Optimization of Gas Metal Arc Welding (GMAW) Process .................. 339

R. Venkata Rao, Sardar Vallabhbhai National Institute of Technology (SV NIT), India

Chapter 15
A Tutorial to Developing Statistical Models for Predicting Disqualification Probability .......... 368

Ilmari Juutilainen, University of Oulu, Finland
Satu Tamminen, University of Oulu, Finland
Juha Röning, University of Oulu, Finland

Compilation of References ........................................................................................................ 400

About the Contributors .............................................................................................................. 431

Index ........................................................................................................................................... 440