Index

A
abrasive water jet (AWJ) 262
Abrasive water jet machining (AWJM) 263
adaptive control constraints (ACC) 86, 88
adaptive control optimization (ACO) 86, 88
Adaptive Resonance Theory 2 (ART2) 10
Adaptive Resonance Theory (ART1) 9-10
Analysis of Variance (ANOVA) 24, 122, 139, 152,
266, 362
ant colony optimization (ACO) 3, 87, 164, 364
artificial intelligence (AI) 85, 87, 100, 106
Artificial Neural Network (ANN) 2, 8, 13, 260,
343-344

B
Back-propagation (BP) neural network 217, 349,
352, 360
BAOV coding/decoding 184
batch-type manufacturing 2
bearing area parameters 52-55
Box-Cox Transformation 380
Brinell-harness (HB) 372

C
Cell Formation Problem (CFP) 1
Cellular Manufacturing System (CMS) 1, 4
cellular system design problem (CSDP) 12
Central Composite Design 360
central composite rotatable design (CCRD) 269
Centre Line Average (CLA) 86
chemical vapor deposition diamond (CVDD) 149
competitive learning rule 3, 9
Computer Aided Process Planning (CAPP) 157, 163
computer numerical control (CNC) 162
Conditional Distribution 369-372, 381-382, 385,
395, 399
Contact Tip-Work Distance (CTWD) 350
Cutting Force Uniformity (CFU) 119

D
data normalization 112-114, 128
delta learning rule 3
Design of Experiment (DOE) 359, 362
Deviation model 374
digital strain gauge amplifier 113
direct clustering analysis (DCA) 8
Direct Numerical Control (DNC) 68, 82
disqualification likelihood 371, 383-385
DNC System 67-70, 81-84
dominated solutions 46
Double-Electrode Gas Metal Arc Welding (DE-
GMAW) 357
dynamic programming 87, 163, 165, 220
Dynamometers 113

e-glass-fibre-epoxy composite (e-glass-FEC) 242
electrochemical spark machining (ECSM) 242-243,
245
electro-discharge machining (EDM) 145
Enhanced Assumed Strain (EAS) 288-289, 291
Error Distribution 378
Evolutionary Algorithm (EA) 8, 44-45, 48-50, 62-
65, 148, 298, 304-306, 308
evolutionary approaches (EA) 3

F
fatigue failure 263
fiber-reinforced polymer (FRP) 262
Finish Machining 168-169, 171, 175, 191-192
Finite Element Method (FEM) 100, 193-194, 288,
296, 349, 363
flexible manufacturing systems (FMS) 2
Flow shop system 3-4
F-score 390
full factorial design (FFD) 144, 149
Fuzzy ART K-Means Clustering Technique (FAK-MCT) 25
Fuzzy ART Neural Network 1, 9-10, 13, 25-27, 40
Fuzzy Inference System (FIS) 99, 227-228
Fuzzy Logic (FL) 87, 356
Fuzzy Neural Network (FNN) 10
fuzzy optimization method 85, 87
fuzzy set based optimization 95, 97, 99, 106
fuzzy set theory 2, 10, 95, 106, 221, 227-228, 251

G
Gas Metal Arc Welding (GMAW) 339-343, 347-349, 354, 362, 365-366
Gas Tungsten Arc Welding (GTAW) 361
Gaussian model 373
Generalized Additive Models for Locations Scale and Shape (GAMLSS) 382
Genetic Algorithm (GA) 11, 48, 87, 163, 166, 359
genetic programming (GP) 8
geometric programming 142, 163-165, 186-187, 220, 240
glass fiber-reinforced (GFR) 220
Glass fiber reinforced plastic (GFRP) 219
goal programming 45, 220, 237, 240
Green-Lagrange strain tensor 290-291
Grey-fuzzy logic 219, 221, 237, 239, 241
Grey Relational Analysis (GRA) 221-222, 225-226, 232, 236-242, 244, 248, 258-260, 360, 365
grey relational grade 222, 226-227, 229, 231-234, 236, 248-252, 258, 360
Grinding 194
grinding burn 194, 197, 216, 218
Group technology (GT) 2, 4

H
Heat Affected Zone (HAZ) 194, 204, 207, 214-215, 217-218
hebbian learning rule 3
high surface temperatures 194
honning process 52
hybrid Taguchi Response Surface Method (HTRSM) 269
Hybrid Techniques 1, 34
Hyperelastic Model 298, 301, 307-315
Incremental Sheet Forming (ISF) 294
Intelligent Manufacturing 36-38, 41, 108, 365, 396

J
Job shop system 3
Joining
  - Compression Beading 329
  - External Inversion 320
just-in-time (JIT) 2

K
kerf quality characteristics (KQCs) 263
Kevlar fiber-reinforced polymers (KFRP) 263

L
Levenberg-Marquardt algorithm (LM) 210, 213, 216, 298, 304-306, 308, 360
Levenberg-Marquardt BP (LMBP) algorithm 360
Ligia exotica 67-70
Log-Likelihood 375-377, 381-383, 388, 399

M
machine cell formation 6-7, 9, 22, 36-37, 39-41
machine cell-part family formation 7
Machine-Part Grouping Method (MPGM) 2
machingning condition constraints 163, 170-171
Machining Direction 119, 141
machining optimization 85, 90-91, 100, 122, 126, 160, 178, 183-185, 187
Machining Time (MT) 119
Machining Tolerance 119, 126
manufacturing cells 2, 4-6, 31, 39, 42-43
Marangoni Effect 361
Material Removal Rate (MRR) 121, 224, 242-244, 250
MATLAB 19, 25, 27, 91, 97, 156, 160, 210-211, 233, 273, 349, 351-352, 354, 357
maximum likelihood (ML) 375
mean square deviation (MSD) 268
Mean Square Error (MSE) 209-210, 355
swarm intelligence 68, 71, 159-160, 188, 192
swarm robotics 68

T
tabu search (TS) 3, 11
Taguchi, Genichi 246, 261
Taguchi Method (TM) 114, 140-141, 166, 189, 219, 221, 238-242, 244-247, 258-259, 261, 263-264, 266, 269, 286, 360, 362, 365, 367
Taguchi quality loss function (TQLF) 271, 279
thermal strength (RM) 372
thermal modelling 194, 196
toolpath strategies 116
transiently chaotic neural network (TCNN) 10
travelling salesman problem (TSP) 164
Tube Forming 319-322, 324, 332, 334, 337
tungsten-copper electrodes 144-145
union rule matrix (URM) 253
volume sensitivity model (VSM) 11
Wireless Local Area Network (WLAN) 69
work-in-progress (WIP) 4
yield strength (RP02) 372