

Index

- a priori knowledge, 65
- adaptation, 30, 252
- adaptive control, 33, 77, 128, 239
- aircraft modelling, 255
- Akaike's criterion, 94
- aluminium, 207
- ANOVA, 160
- approximation theory, 1
- ASMOD, 83, 85, 122, 161
- ASMOD, algorithm, 90
- automotive control, 78, 141

- B-splines, 153, 157
- backpropagation, 182, 259
- basis functions, 85, 156
- batch backpropagation, 183
- batch fermentation process, 100
- bias and variance, 109
- biotechnology, 127, 137
- BP, 182

- car body steel, 212
- characteristic manifolds, 141
- classification, 201, 221
- clustering, 70, 245
- CMAC, 27, 129, 134
- competitive network, 255, 257
- complexity detection, 71
- conjugate gradient, 185
- constructive learning, 69
- constructive modelling, 61, 153, 167
- continuous functionals, approximation of, 16
- coolant flow, 260
- corrosion, 201, 212
- curse of dimensionality, 159

- data reduction, 154
- decomposition, ANOVA, 160
- differential approximation, 19, 22
- dimensionality, curse of, 159
- drying oven, 239
- dynamic systems, 27

- empirical modelling, 83, 105, 153
- energy systems, 221
- estimation, 88, 159, 180, 246
- estimation, local models, 67

- feedforward network, 241
- feedforward networks, 2, 16, 20
- fermentation control, 137
- fermentation reactor, 117
- forecasting system, 226
- forward model identification, 249
- full memory algorithm, 188
- fuzzy systems, 153, 155

- gradient algorithm, 47
- gradient methods, 179

- hardware, 196
- heat exchanger, 255, 260
- hierarchical modelling, 173
- hierarchical network, 255
- Hilbert's Problem, 6
- hydraulic manipulator, 121

- indirect control, 35
- internal model control, 253
- interpolating memories, 127, 131
- interpolation, 203

- Kaczmarz's algorithm, 32
- Kohonen map, 202, 221
- Kohonen network, 201, 221
- Kolmogorov's theorem, 6

- lattice representations, 161
- learning, 31
- learning control, 127
- linear models, 62
- load data analysis, 223
- load forecasting, 221
- local controller networks, 75
- local controllers, 61
- local model networks, 63, 105, 108
- local models, 61, 105

Lyapunov stability, 52, 55
 MARS, 122, 161
 membership functions, 156
 metal oxide surfaces, 201, 206
 MIAS, 134
 MIMO systems, 43
 MLP, 28, 179
 modelling, 61
 multi-resolution algorithm, 70
 multidimensional sampling, 9
 multilayer network, 241
 multilayer perceptron, 179

 NARMAX model, 2, 44, 61, 106, 241, 247
 neural approximation, 1, 5, 7
 neural modelling, 15, 17
 neurocontrol, 43, 61, 75, 243
 neurofuzzy systems, 153, 155

 object oriented design, 171
 off-line training, 179
 operating regimes, 105, 107
 optimisation, 67, 88, 159, 180, 246
 overfitting, 74

 paint adhesion, 201
 parallel processing, 179, 194
 parallelisation, 194
 parsimony, 154
 partial least-squares, 165
 perceptron, 179
 PLS, 165
 pole assignment, 77
 prediction, 201, 208
 predictive control, 34
 projection pursuit, 166
 projections, 164
 pruning, 92

 radial basis function, 5, 28, 64, 204, 239, 244
 RBF, 28
 RBF networks, 204, 239, 244
 recurrent networks, 19

 recurrent networks, approximation with, 19
 RLS, 32
 robot manipulator, 121
 robotics control, 148

 sample properties, 96
 sampling theory, 9
 spectrometry, 206
 splines, 83, 85, 153, 157
 stability, 49
 stability theory, 43, 55
 steering control, 78
 Stone-Weierstrass theorem, 3
 structure identification, 68, 89, 108, 113
 structure selection, 93

 Taylor series analysis, 184
 temperature control, 239, 254
 tensor product, 86
 transputers, 179, 196

 weights, initialisation, 53