
Index

- a priori* probability, 94
- Abstraction (generalization) level, 351
- Accelerated backpropagation algorithm, 99ff
- Activation function, 81
 - selection, 111
- ADALINE, 79, 83
- Adaptive evolutionary systems, 4
- Adaptive fitness function, 322
- Adaptive fuzzy logic system, 232
- Adaptive genetic algorithm, 198, 231, 321ff
- Adaptive genetic operators, 322
- Adaptive learning rate, 99, 246 ff
- Adaptive neuro-fuzzy approach, 232
- Adaptive operator selection, 322
- Adaptive parameter setting, 322
- Adaptive representation, 322
- Adatron, 342ff
- Affine wavelet decomposition, 348
- Age
 - operator, 328
 - of chromosome, 328
 - structure of population, 328
- AIC *see* Akaike information criterion
- Akaike information criterion (AIC), 45, 109
- AND fuzzy neuron, 228ff
- ANFIS architecture, 9, 226, 230
- Antecedent parameters of fuzzy clustering, 185
- Approximate reasoning, 5
- Approximated reasoning, 5
- AR model, 27
- ARIMA model, 29, 131, 132
- ARMA model, 28
- Artificial intelligence, 8, 9
- Association cortices, 351
- Associative memory, 80, 351
- Associative memory networks, 80
- Auto-associative capabilities, 88
- Autocorrelation
 - structure, 107
- Automated rules generation, 157ff
- Autonomous mental development, 9
- Autoregression model, 27
- Auxiliary genetic operators, 201
- Axons, 81
- Backpropagation
 - learning, 79, 85
 - networks 4, 85
 - through time, 90
 - training algorithm, 95, 237
 - training implementation, 97
 - training of neuro-fuzzy network, 234ff
- Bayesian belief networks, 5

- Bayesian information criterion, 45
- Behavioural models, 7, 214
- Belief theory, 4
- Bell-shaped function, 86
- Best approximator, 129
- Best generalization, 120
- Bias error, 120
- Bias, 81
- Bias-Variance dilemma, 119, 120
- Bi-directional associative memory, 92
- Binary Hopfield net, 89
- Binary logic, 143
- Binary step function, 81
- Bivalent logic, 5
- Bivariate time series, 33
- Bioinformatics, 335
- Box-Jenkins approach, 84
- B-spline functions, 86

- Cai's fuzzy neuron, 230
- CARIMA model, 71ff
- CARMAX model, 32, 69
- Cell body, 80
- Cellular encoding, 308, 312
- Census I method, 22
- Census II method, 22
- Central motor cortex, 351
- Centre-of-gravity defuzzification, 150
- Cerebral cortex hierarchy, 351
- Chain of inferences, 5
- Chaotic configuration of data set, 356
- Chaotic time series, 23, 24
 - models, 36
- Characteristic features, 18
- Chromosome age, 328
- Chromosomes, 6, 310
- Classifier systems, 197
- Cluster validity measure, 181, 280
- Clustering
 - covariance matrix, 185
 - fuzziness parameter, 181
 - termination criterion, 182
 - theory, 174
 - using Kohonen networks, 353ff

- C-means functional, 178
- Cognition, 4
- Cognitive functions, 350
- Combined forecast, 64
- Combined fuzzy rule base, 161
- Combined modelling, 136
- Combining neural network and traditional methods, 131ff
- Compact modelling scheme, 279ff
- Compatible cluster merging, 280
- Competition concept, 315
- Competitive layer, 92
- Component level, 322
- Computation of Jacobian matrix, 241
- Computational intelligence, 3, 8ff
- Computing neuron 4, 79
- Conjunction operator, 151
- Connectionist encoding, 308
- Connectivity matrix, 310
- Constructive evolving of neural network, 306
- Context
 - layer, 88
 - nodes, 87
- Counterpropagation networks, 80, 92ff
- Cover's theorem, 337
- Crisp function, 148
- Crisp input, 146
- Crisp logic, 143
- Crisp output, 146
- Crisp set, 144
- Crossover, 6, 7, 195, 196, 201ff, 322
 - operators for real-coded GA, 205ff
 - probability, 323
 - rate, 323
- Cross validation, 118

- Data
 - clustering, 279
 - fuzzification, 159
 - matrix, 174
 - mining, 10, 11
 - normalization, 104
 - preparation for forecasting, 103ff
 - preprocessing, 104

- smoothing, 22, 57
- space, 338
- understanding, 336
- Data-dependent representation, 342ff
- DE 1 variant of differential evolution, 215, 216ff
- DE 2 variant of differential evolution, 215, 218ff
- Decision boundary, 94
- Decision surface, 94
- Decision trees, 87
- Decomposition analysis, 21
- Defuzzification, 146
- Defuzzifier, 146
- Degree of belongingness, 144
- Degree of fulfilment, 153
- Delta learning rule, 312
- Delta rule, 82, 88
- Dempster-Shafer theory, 5
- Dendrites, 81
- De-seasonalizing, 21
- Destructive evolving of NN, 306
- Determination of number of input nodes, 106
- De-trending, 21
- Developmental rules, 312
- Differential evolution, 197, 215
- Dilation coefficients, 348,
- Dimensionality reduction, 34, 291
- Diophantine equation, 62, 69
- Direct encoding approach, 307
- Direct encoding strategies, 309
- Discrete affine wavelet transform, 348
- Disorderly configured data set, 356
- Dissimilar fuzzy sets, 281
- Distinguishable fuzzy sets, 298
- Diversity measure, 323
- Duplication, 196
- Dynamic learning rate, 115
- Dynamic recurrent networks, 91
- Dynamically controlled GAs, 329

- Early stopping, 117, 118, 120
- Edge encoding, 308, 312
- EFC(T) *see* Entropy-based fuzzy clustering, 355ff

- Eigen-nodes, 124
- Elementary learning process, 350
- Elitist strategy, 215
- Elman network, 88
- Energy function, 89
- Enhanced transparency, 277
- Entropy measure for cluster estimation, 356
- Entropy-based fuzzy clustering, 355ff, 358
- Error-correction learning, 85
- Estimation set, 118
- Evidence theory, 6
- Evolution
 - of evolution, 7
 - of evolution strategy, 7
 - window, 213
- Evolutionary algorithms, 196ff
- Evolutionary computation, 4, 6ff, 195, 231
- Evolutionary law, 90
- Evolutionary operators, 195
- Evolutionary programming, 7, 195, 197, 214ff
- Evolutionary programming algorithm, 214ff
- Evolutionary strategies, 7, 195, 197, 212ff
- Evolutionary systems, 197
- Evolving complete network, 311
- Evolving connection weights, 306ff
- Evolving fuzzy logic systems, 313ff
- Evolving network architecture, 310ff
- Evolving neural networks, 305ff
- Evolving the activation function, 312
- Excitatory neurons, 352
- Experiment design, 112
- Exploitation-to-exploration rate, 323

- Failure diagnosis, 68
- FAM, *see* Fuzzy associative memory
- Feature space, 337
- Features, 174
- Feedforward networks, 80
- Feedforward neuro-fuzzy system, 230
- Final prediction error, 123

- Finite-state automata, 7
- Fitness, 6, 196
 - function, 7, 323
 - measure in genetic programming, 211ff
 - windowing, 201ff
- Fixed-point learning, 90
- Fixed-point attractor, 88
- Forecasting
 - chaotic time series using fuzzy logic, 169ff
 - methodology, 49, 103ff
 - multivariate time series, 136
 - nonstationary processes, 66
 - of electrical load, 249
 - using adaptive smoothing, 62
 - using Box-Jenkins method, 53ff
 - using exponential smoothing, 58
 - using fuzzy logic approach, 169ff
 - using simple moving average, 57
 - using neural networks, 129ff
 - using neuro-fuzzy system, 230ff
 - using regression approaches, 51ff
 - using smoothing, 57
 - using trend analysis, 51
 - Fourier series model, 39
- Four-layer network, 88
- Fractally configured networks, 350ff
- Fractally configured neural networks, 335, 350ff
- Frequency domain
 - approach, 18
 - models, 39
- Frontal association cortices, 351
- Full interconnection, 111
- Fully connected recurrent network, 90, 91
- Function defining branches, 211
- Functional knowledge, 336
- Fuzzifier, 146
- Fuzziness, 5, 6
- Fuzzy associative memory, 226
- Fuzzy clustering, 198, 279, 352
 - algorithm, 173ff
- Fuzzy *c*-means algorithm, 179ff, 352
- Fuzzy *c*-means clustering, 178ff
- Fuzzy expert systems, 146
- Fuzzy government module, 329
- Fuzzy implication, 151
- Fuzzy inference, 224, 225
 - engine, 146
 - system, 147
- Fuzzy input regions, 159
- Fuzzy knowledge, 5
- Fuzzy Kohonen clustering networks, 353
- Fuzzy logic, 3, 4, 143
 - approach, 143ff
 - systems, 146ff
 - technology, 336
- Fuzzy-logic-based neurons, 224
- Fuzzy-logic-controlled GAs, 329ff
- Fuzzy model identification using EFC, 359
- Fuzzy modelling, 277ff
- Fuzzy net controller, 316
- Fuzzy neuro systems, 4
- Fuzzy neurons, 224, 227ff
- Fuzzy output regions, 159
- Fuzzy partition, 177ff
- Fuzzy probability, 6
- Fuzzy reasoning, 5
- Fuzzy rule base generation, 157ff
- Fuzzy rule systems, 146
- Fuzzy set, 143

- GA, *see* Genetic algorithm
- Gabor transform, 345
- Gaussian function, 86
- Gauss-Newton method, 103, 240
- Gauss-Newton modification, 102
- Gbest solution, 336
- General predictive control, 71
- General systems theory, 350
- Generalization
 - attribute, 112
 - capability, 125
 - of Hausdorff distance, 284
- Generalized autoregressive operator, 29
- Generalized backpropagation rule, 90
- Generalized delta rule, 95
- Generalized likelihood ratio, 48

- Generalized optimal brain surgeon, 124
- Generalized RBF network, 349
- Genes 6,
- Genetic Algorithm (GA), 7, 195, 197, 231
 - adaptation
 - at component level, 322
 - at individual level, 322
 - at initial stage, 324
 - at population level, 322
 - at refinement stage, 324
 - at search stage, 324
 - of learning rate, 100, 246
 - of population size, 327
 - age operator, 328
 - implementation, 200
- Genetic evolution, 7
- Genetic models, 7, 214
- Genetic operators, 198ff
- Genetic programming (GP), 7, 195, 197, 209ff
 - algorithm, 210ff
- Genotypes, 307
- Genotypic diversity measure, 330
- Genotypic representation, 309
- Geometric pyramid rule, 109
- Globally feed-forward, locally recurrent network, 87
- Government of genetic population, 329
- GP, *see* Genetic programming
- Gradient descent law, 96
- Grammar re-writing rules, 311
- Grammatical encoding, 311
- Graph grammar encoding, 312
- Green's function, 127
- Green's matrix, 128
- Grossberg output layer, 92
- Grossberg outstar, 93
- Growth encoding, 308
- Gustafson-Kessel (GK) algorithm, 183ff, 352

- Hard clustering, 175
- Hard partition, 175ff
- Hausdorff distance, 284

- HBXIO matrix, 67, 135
- Hebbian law, 88
- Hebbian learning rule, 112, 113
- Hessian matrix calculation, 101ff
- Hidden layers, 82, 107
- Hierarchically organised modular systems, 350
- Higher-level learning process, 350
- HMIQ technology, 9
- Holt-Winter algorithm 61
- Hopfield network, 88, 89ff
- Hybrid ARIMA-neural network methodology, 132
- Hybrid computational technology, 9
- Hybrid intelligent systems, 223
- Hybrid training algorithm, 307
- Hyperbolic tangent function, 111

- Identification of nonlinear dynamics, 249
- IF-THEN rules, 143, 145, 232, 275
- Ill-posed problems, 126
- Image interpretation, 336
- Implication-OR neuron, 230
- Imprecise propositions, 5
- Improved BP training algorithm, 238ff
- Improved genetic version, 211ff
- Indirect encoding
 - approach, 307
 - strategies, 309
- Inferencing
 - of fuzzy logic systems, 150
 - of Mamdani model, 150
 - of Takagi-Sugeno model, 153
 - relational model, 154
- Inhibitory neurons, 352
- Initial fuzzy model, 280
- Initial partition matrix, 182
- Initialization of genetic programming, 210ff
- Initialization of RBF centres, 87
- Inner product kernel, 341
- Input layer, 82, 85
- Integral wavelet transform, 349
- Intelligent agents, 8
- Intelligent signal processing, 10

- Interpretation and decision level, 351
- Iterative merging, 181, 292ff
- Jaccard index of similarity, 284, 285
- Jaccard similarity
 - index, 284
 - measure, 291
- Jacobian matrix computation, 241
- Kernel function family, 339
- Kernel-based machine, 339ff
- K-means clustering algorithm, 87
- Knowledge (fuzzy), 5
- Knowledge extraction from data, 336
- Kohonen networks, 4, 353
- Kolmogorov's superposition theorem, 107
- Kwan fuzzy neuron, 230
- Layer-based encoding, 308
- Learning rate, 114
- Learning theory, 4
- Lethal age of chromosomes, 328
- Levenberg-Marquardt algorithm, 100, 231, 239ff, 246
- Lifetime of chromosome, 328
- Linear time series, 23
 - models, 23, 35
- Linear vector quantisation, 87
- Linearity, 18, 20
- Linearly separable classes, 338
- Linearly separable problems, 82
- Linguistic terms, 143
- Linguistic variables, 148
- Localized basis functions, 85
- Locally restricted basis functions, 86
- Logarithmic scaling, 104
- MA model, *see* Moving average model
- Machine learning, 209
- Mackey-Glass chaotic time series, 172
- MADALINE, 79, 83
- Mahalanobis norm, 182
- Mamdani fuzzy rules, 148
- Mamdani fuzzy system, 148
- Mamdani inference system, 148ff, 150ff
- Margin of separation, 338
- Material property prediction, 265ff
- Mating pool, 199
- Matrix
 - grammar encoding, 311
 - inverse unit, 91
 - re-writing, 308
- Maturation operator, 214
- Maximum likelihood estimate, 110
- Maximum likelihood method, 45
- Max operator, 228
- Mean of maximum de-fuzzifier, 247
- Mechanism of evolution, 196ff
- Membership function 144ff, 148, 225
- Mercer's theorem, 342
- Merging
 - rules, 290
 - similar fuzzy sets, 287ff
- Min operator, 228
- Minimum variance control, 69
- Minkowski class of distance function, 284
- MLP *see* Multilayer perceptron
- MLPN *see* Multilayer perceptron network
- Model
 - accuracy, 296
 - building, 42
 - compactness, 276
 - complexity, 296
 - deterministic, 26
 - diagnostic check, 48ff
 - estimation phase, 42
 - estimation, 42, 45ff
 - evaluation, 280
 - forecasting phase, 42
 - identification phase, 42, 43ff
 - stochastic, 26
 - structure selection, 279
 - transparency, 276
 - validation phase, 42, 48ff
- Modelling
 - of nonlinear dynamics, 249

- of nonlinear plants, 187
 - redundancy, 279
- Momentum term, 99ff, 114ff
- Monotonic basis functions, 86
- Mother wavelet, 345, 348
- Moving average (MA) model, 28
- Multi-agent systems, 337
- Multilayer network, 309
- Multilayer perceptron (MLP), 82
 - network (MLPN), 80, 85ff
- Multisensor data fusion, 11
- Multistep prediction, 90
- Multivalued logic, 143
- Multivariable fuzzy model, 227
- Multivariate forecasts, 50
- Multivariate models, 33
- Multivariate statistical analysis, 136
- Multivariate time series, 24
- Mu-matrix, 162ff
- Mutation, 6, 7, 195, 199, 322
 - operators, 205ff
 - probability, 323
- Nested networks, 351
- Network
 - architecture, 80ff
 - determination, 103, 106ff
 - evolution, 305ff
 - growing, 121
 - information criterion, 110
 - initialization, 112
 - overfitting, 117, 119
 - overtraining, 117, 119
 - pruning, 121
 - strategy design, 104
 - training methods, 95ff
 - training strategy, 104, 112ff
 - underfitting, 119
- Networks training, 248
- Neural inputs, 225
- Neural-fuzzy inference network, 266
- Neural networks approach, 79
- Neural networks with fuzzy weights, 224
- Neurobiology 9,
- Neurocomputing, 3
- Neurodynamic programming, 335
- Neurodynamics, 335
- Neuro-forecasters, 129ff
- Neuro-fuzzy adaptive approach, 232
- Neuro-fuzzy method, 279
- Neuro-fuzzy modelling, 270, 275
- Neuro-fuzzy network, 247
- Neuro-fuzzy predictor, 267
- Neuro-fuzzy systems, 4
- Neuroinformatics, 9, 335
- Neuron, 81
- NIC *see* Network information criterion
- NL dynamics, *see* Nonlinear dynamics
- Neural network
 - learning algorithm, 224
 - representation of fuzzy logic system, 233ff
- Node-based encoding, 308
- Noninfluential singleton, 278
- Noninterpretable fuzzy set, 278
- Nonlinear combination of forecasts, 64, 132ff
- Nonlinear dynamics, 249
- Nonlinear regression estimation,, 344
- Nonlinear scaling, 104
- Nonlinear time series, 23
 - models, 35
- Non-monotone neural networks, 351
- Non-symbolic methodology, 275
- Norm inducing matrix, 182
- Normalization of data, 104
- Number of hidden neurons, 108
- Number of input nodes, 107
- Number of lagged values, 106
- Number of output nodes, 107
- Objective forecasts, 50
- Objectives of analysis, 25
- Objects, 174
- Observation matrix, 39, 105
- Observation of vector, 39, 105
- Occam's razor philosophy, 125
- Offspring, 196
- Optimal brain damage, 122, 123
- Optimal brain surgeon, 122, 123

- Optimal hyperplane, 338
- Optimal path planning, 11
- OR fuzzy neuron, 229ff
- Orderly configured data set, 356
- Oscillation control, 246
- Outliers, 177
- Output
 - decisions, 225
 - layer, 82
 - weight training of RBF, 87
- Overall network evaluation, 104
- Overfitting, 111
- Overtraining, 125

- Parameterised encoding, 311
- Parameters of fuzzy c-means
 - algorithm, 180ff
- Parameters to be adapted, 322ff
- Parse trees, 209
- Partial autocorrelation function, 44
- Partially bounded open systems, 350
- Particle swarm optimisation, 336
- Pattern
 - matrix, 174
 - unit, 95
- Pbest solution, 336
- Penalty term method, 121
- Perceptron, 4, 81
- Perceptual knowledge, 336
- Performance-to-cost ratio, 117
- Permutation problem, 311
- Phenotypes, 307
- Phenotypic diversity measure, 330
- Phylogenetic adaptation, 213
- Polynomial ADALINE, 94
- Polynomial curve fitting, 120
- Polynomial kernels, 341
- Population, 6, 196
 - age structure, 328
 - level, 322
 - member, 196
 - of parents, 214
 - size, 323
 - survival, 196
- Possibilistic partition, 177
- Possibilistic reasoning, 5
- Possibility
 - distribution, 6
 - theory, 6
- Potential function approach, 85
- Potential measure, 356
- Precise propositions, 5
- Predicate logic, 5
- Prediction of chaotic time series, 253ff
- Pre-processing of data, 104
- Principal components analysis, 34, 124
- Probabilistic neural networks, 80, 94ff
- Probabilistic parameters control, 323ff
- Probabilistic reasoning, 3, 4ff
- Probability, 5, 6
 - density function, 95
- Processing elements, 83
- Product inference rules, 247
- Product operator, 153
- Production monitoring, 68
- Propositional calculus, 5
- Prototype wavelet, 345
- Pruning methods, 123
- Pure network architecture, 310ff

- Quality prediction of crude oil, 67

- Radial basis function, (RBF) 85
- Radial-basis-function-based support
 - vector machine, 344
- Radial basis neural networks, 80, 85, 247
- Ramp function, 111
- Randomness, 5
- Rapid prototyping, 316
- RBF, *see* Radial basis function
- Real-coded GA, 203ff
- Real genetic operators, 204ff
- Real-time recurrent learning
 - algorithm, 90
- Recognition level, 351
- Recombination, 195
- Recurrent networks, 4, 80, 87ff, 309
- Regression
 - analysis, 27

- methods, 129
- Regressive models, 27ff
- Regularization
 - approach, 126
 - degree, 126
 - parameter, 126
 - method, 126
 - network, 128
- Relational fuzzy logic system, 147, 149ff
- Relational fuzzy model, 154ff
- Removing irrelevant fuzzy sets, 289ff
- Removing redundant inputs, 290ff
- Reproduction, 196, 199, 323
- Residual diagnostics, 48
- Resonating neural networks, 80
- Result producing branches, 212
- Ridge regression method, 129
- Robust regression, 349
- Robust wavelet network, 349
- Roulette wheel selection, 199
- Rule base
 - reduction, 286
 - redundancy, 279
 - simplification, 285
 - simplification algorithms, 291ff
- Rule grade table, 158
- Rules
 - degree assignment, 160
 - generation, 157
 - algorithm, 157ff
 - by clustering, 173ff
- Saliency measure, 124
- Saliency of the weights, 122, 123
- Sample autocorrelation function, 44
- SARIMABP model, 131
- Scalability problem, 311
- Search vector, 101
- Seasonality, 19, 21
- Selection, 7, 195, 199
 - function, 204ff
 - procedure, 199ff
- Self-organising map, 92
- Self-organising networks, 79
- Semantic knowledge, 336
- Sensitivity calculation method, 121
- Sensory cortices, 351
- Sensory level, 351
- Separate modelling approach, 136
- Separating hyperplanes, 86
- S*-expressions based encoding, 308
- Short-term forecasting, 249ff
- Short-term memory feature, 87
- Sigmoid activation function, 81, 82, 99, 111
- Sigmoid kernels, 342
- Similar fuzzy sets, 281
- Similarity
 - measure, 276, 282
 - of fuzzy sets, 281
 - relations, 294ff
- Similarity-based rule base
 - simplification, 282ff
- Similarity-based simplification, 280
- Similarity-driven simplification, 277
- Simplification of rule base, 285ff
- Simulated annealing, 197
- Singleton, 278
- Smoothness degree, 126
- S*-norm, 228
- Soft computing, 3ff
- Soma, 81
- Spectral Analysis, 39
- Spectral expansion technique, 41
- Spread parameter, 87
- Sprecher theorem, 108
- State-space
 - equations, 91
 - modelling, 36
 - models, 38
- Stationarity, 18
- Stationary model, 19
- Statistical bias, 119
- Statistical learning theory, 337
- Statistical modelling approach, 136
- Statistical variance, 119
- Step function, 111
- Stochastic biochemical networks, 335
- Stochastic difference equation, 36
- Stochastic machines, 335

- Stopping
 - criterion, 117, 118, 123
 - with cross-validation, 120
- Structural risk minimisation, 337
- Structuring of data, 105
- Summation unit, 95
- Supervised learning, 85
 - algorithms, 95
- Supervised mode, 4, 112
- Supervisory mode, 4
- Support vector machines, 335, 337ff
- Support vectors, 338
- Survival of the fittest principle, 196, 215
- Swarm engineering, 337
- Synaptic weights, 96

- Takagi-Sugeno fuzzy model, 232
- Takagi-Sugeno fuzzy system, 148
- Takagi-Sugeno inference system, 153ff
- Technology merging, 223
- Test set, 118
- Theory of belief, 6
- Tikhonov functional, 126
- Time domain
 - approach, 18
 - models, 37
- Time series
 - analysis, 17, 25ff
 - classification, 22ff
 - modelling, 26
 - models, 26
- T -norm, 151, 228
- Tool wear monitoring, 68, 268ff
- Traditional problem definition, 18ff
- Training
 - algorithm for neuro-fuzzy network, 234
 - efficiency merit, 116
 - set of data, 105
 - stopping and evaluation, 116ff
 - strip length, 119
- Trajectory learning, 90

- Transfer function models, 37
- Translation coefficients, 348
- Transparent fuzzy modelling scheme, 279
- Transparent modelling scheme, 279
- Transparent partitioning, 298
- Trend, 18, 20
- Trend cycle, 21
- Triangular-conorm, 228, 229

- Uncertain information, 6,
- Unconstrained minimisation, 96
- Underfitting problem, 119
- Univariate forecasts, 50
- Univariate time series, 23
- Universal approximator, 84, 129, 348
- Universal fuzzy set, 278
- Universe of discourse, 144
- Unsupervised clustering, 87
- Unsupervised mode, 4, 112

- Validation set of data, 106, 118
- Vapnik-Chervonenkis dimension, 108, 337

- Wavelet neural networks, 335, 346ff
- Wavelet theory, 345ff
- Wavelet transform, 345
- Wavelets, 86
- Wavelets networks, 345ff
- Weakest-link-in-the-chain analysis, 116
- Weierstrass theorem, 129
- Weight decay approach, 125
- Weight elimination approach, 125
- White-box models, 276
- Wildness factor, 246
- Winner-takes-all fashion, 92
- World's decomposition, 23

- Xie-Benie's index, 181, 280, 355
- Yule-Walker equation, 44, 47