
INDEX

- A posterior distribution 146
- A priori algorithm 283
 - Partition-based 287
 - Sampling-based 287
 - Incremental updating 287
 - Concept hierarchy 288
- A prior distribution 146
- A priori knowledge 5, 88
- Approximating functions 90
- Activation function 201
- Agglomerative clustering algorithms 260
- Aggregation 16
- Allela 386
- Alpha cut 419
- Alternation 396
- Analysis of variance (ANOVA) 150, 155
- Anchored visualization 457
- Andrews's curve 452
- Approximate reasoning 430
- Approximation by rounding 76
- Artificial neural network (ANN) 105, 199
- Artificial neural network, architecture 205
 - feedforward 205
 - recurrent 205
 - Competitive 221
 - Self-organizing map (SOM) 225
- Artificial neuron 202
- Association rules 105, 280
 - Apriori 283
 - FPgrowth 288
 - Classification based on multiple association rules (CMAR) 290
- Asymptotic consistency 94
- Autoassociation 211
- Authorities 305
- Bar chart 450
- Bayesian inference 146
- Bayesian networks 370
- Bayes theorem 147
- Binary features 255
- Bins 74
- Bins cutoff 74
- Bootstrap method 125
- Boxplot 144
- Building blocks 402
- Candidate counting 283
- Candidate generation 283
- Cardinality 419
- Cases reduction 104
- Causality 369
- Censoring 41
- Centroid 252, 263
- Chameleon 262
- Change detection 3, 104
- Chernoff's faces 453
- ChiMerge technique 77
- Chi-squared test 79, 161
- Chromosome 386
- Circular coordinates 458
- City block distance 254
- Classification 3
 - CART 189
 - C4.5 185
 - ID3 172
 - k-NN 118
 - SVM 105
- Classifier 118, 139, 240
- CLS 173
- Cluster analysis 105, 249

- Cluster feature vector (CF) 268
- Clustering 3, 250
 - BIRCH 272
 - DBSCAN 270
 - Validation 275
 - k*-means 264
 - k*-medoids 266
 - Incremental 266
 - Using genetic algorithms 409
- Clustering tree 252
- Competitive learning rule 221
- Complete-link method 260
- Confidence 282, 291
- Confirmatory visualization 450
- Confusion matrix 126
- Contingency table 77, 159
- Control theory 5, 208
- Core 419
- Correlation coefficient 154
- Correspondence analysis 159
- Cosine correlation 255
- Covariance matrix 45, 62
- Crisp approximation 438
- Crossover 392
- Curse of dimensionality 29

- Data cleansing 15
- Data scrubbing 15
- Data collection 7
- Data constellations 454
- Data cube 451
- Data discovery 6
- Data integration 15
- Data mart 14
- Data mining 2
 - Privacy 377
 - Security 379
 - Regal aspects 378
- Data mining process 6
- Data mining roots 4
- Data mining tasks 3
- Data preprocessing 8
- Data quality 13
- Data set 2
 - Iris 72
 - messy 32
 - preparation 33
 - quality 13
 - raw 32
 - semistructured 11
 - structured 11
 - temporal 28
 - time-dependent 37
 - transformation 15
 - unstructured 11
- Data set dimensions 54
 - cases 54
 - columns 54
 - feature values 54
- Data sheet 454
- Data smoothing 34
- Data types,
 - alphanumeric 11
 - categorical 27
 - dynamic 28
 - numeric 11, 26
 - symbolic 27
- Data warehouse 14
- Data representation 26, 395
- Decimal scaling 33
- Decision node 173
- Decision rules 105, 185
- Decision tree 105, 183
- Deduction 88
- Default class 188
- Defuzzification 433
- Delta rule 208
- Dendogram 262
- Dependency modeling 3, 103
- Descriptive accuracy 55
- Descriptive data mining 2
- Designed experiment 7
- Deviation detection 3, 104
- Differences 35
- Dimensional stacking 454
- Directed acyclic graph (DAG) 371
- Discrete optimization 388
- Discrete Fourier Transform 348
- Discrete Wavelet Transform 348
- Discriminant function 163
- Distance error 75
- Distance measure 254
- Distributed data mining 360
 - Distributed DBSCAN 366
- Divisible clustering algorithms 260
- Document visualization 319
- Domain-specific knowledge 7
- Don't care symbol 400

- Eigenvalue 72
- Eigenvector 72
- Empirical risk 94
- Empirical risk minimization (ERM) 94
- Encoding 8
- Encoding scheme 389
- Ensemble learning 235
 - Bagging 241
 - Boosting 242
 - AdaBoost 243
- Entropy 70
- Error back-propagation algorithm 214
- Error energy 208
- Error-correction learning 208
- Error rate 126
- Euclidean distance 65, 69, 120, 254
- Exponential moving average 39
- Exploratory analysis 2
- Exploratory visualizations 450
- Extension principle 426

- False acceptance rate (FAR) 130
- False reject rate (FRT) 130
- Fault tolerance 201
- Feature discretization 79
- Features composition 58
- Features ranking 59
- Features reduction 56
- Features selection 57
 - Relief 66
- Filtering data 212
- First-principle models 1
- Fitness evaluation 390
- Free parameters 100, 207
- F-list 291
- FP-tree 281
- Function approximation 211
- Fuzzy inference systems 105
- Fuzzy logic 429
- Fuzzy number 420
- Fuzzy relation 425
 - containment 425
 - equality 425
- Fuzzy rules 430
- Fuzzy set 415
- Fuzzy set operation 420
 - complement 421
 - cartesian product 421
 - concentration 424
 - dilation 424
 - intersection 420
 - normalization 424
 - union 420
- Fuzzification 433

- Gain function 175
- Gain-ratio function 180
- Gaussian membership function 418
- Gene 386
- Generalization 95, 122, 219, 288, 301
- Generalized Apriori 171
- Generalized modus ponens 431
- Genetic algorithm 105, 386
- Genetic operators 387, 390
 - crossover 392
 - mutation 393
 - selection 390
- Geometric projection visualization 451
- GINI index 189
- Glyphs 453
- Gradviz 460
- Graph mining 329
 - Centrality 336
 - Closeness 336
 - Betweenness 336
- Graph compression 341
- Graph clustering 341
- Gray coding 390
- Greedy optimization 97
- Grid-based rule 436
- Growth function 95

- Hamming distance 422
- Hamming networks 223
- Hard limit function 203
- Heteroassociation 211
- Hidden node 217
- Hierarchical clustering 252
- Hierarchical visualization techniques 454
- Histogram 450
- Holdout method 125
- Hubs 305
- Hyperbolic tangent sigmoid 203
- Hypertext 317

- Icon-based visualization 453
- Induction 88
- Inductive-learning methods 97

- Inductive machine learning 89
- Inductive principle 93
- Info function 175
- Information visualization 450
- Information retrieval (IR) 304
- Initial population 395
- Interesting association rules 286
- Internet searching 316
- Interval scale 27
- Inverse document frequency 317
- Itemset 283
- Jaccard coefficient 256
- Kernel function 114
- Knowledge distillation 318
- Large data set 9
- Large itemset 283
- Large reference sequence 312
- Lateral inhibition 222
- Latent semantic analysis (LSA) 320
- Learning machine 89
- Learning method 89
- Learning process 88
- Learning tasks 101
- Learning theory 93
- Learning rate 209
- Learning system 99
- Learning with teacher 99
- Learning without teacher 99
- Leave-one-out method 125
- Lift chart 126
- Line chart 450
- Linear discriminant analysis (LDA) 162
- Linguistic variable 424
- Local gradient 216
- Locus 386
- Logical classification models 173
- Log-linear models 158
- Log-sigmoid function 203
- Longest common sequence (LCS) 349
- Loss function 92
- Machine learning 4
- Mamdani model 436
- Manipulative visualization 450
- Multivariate analysis of variance (MANOVA) 156
- Market basket analysis 281
- Markov Model (MM) 351
 - Hidden Markov Model (HMM) 351
- Max-min composition 428
- MD-pattern 294
- Mean 34, 44, 60, 143
- Median 143
- Membership function 416
- Metric distance measure 254
- Minkowski metric 255
- Min-max normalization 33
- Misclassification 92
- Missing data 36
- Mode 143
- Model 6
 - estimation 126
 - selection 122
 - validation 126
 - verification 126
- Momentum constant 218
- Moving average 32
- Multidimensional association rules 293
- Multifactorial evaluation 433
- Multilayer perceptron 213
- Multiple discriminant analysis 164
- Multiple regression 152
- Multiscale 454
- Mutual neighbor distance (MND) 258
- Naïve Bayesian classifier 147
- N-dimensional data 101
- N-dimensional space 101
- N-dimensional visualization 105
- N-fold cross-validation 125
- Necessity measure 423
- Negative border 285
- Neighbor number (NN) 258
- Neuro-Fuzzy system 442
- Nominal scale 27
- Normalization 33
- NP hard problem 47
- Null hypothesis 142
- Objective function 110, 388
- Observational approach 7
- OLAP (Online analytical processing) 17
- Optimization 98
- Ordinal scale 28
- Outlier analysis 41

- Outlier detection 7, 42
- Outlier detection, distance based 45
- Overfitting (overtraining) 97
- PageRank algorithm 313
- Parabox 454
- Parallel coordinates 455
- Parameter identification 5
- Partially matched crossover (PMC) 403
- Partitioning clustering 263
- Pattern 6
- Pattern association 211
- Pattern recognition 211
- Pearson correlation coefficient 61
- Perception 488
- Perceptron 200
- Pie chart 451
- Piecewise aggregate approximation (PAA) 346
- Pixel-oriented visualization 453
- Population 141, 390
- Possibility measure 423
- Postpruning 184
- Prediction 2
- Predictive accuracy 124
- Predictive data mining 2
- Predictive regression 149
- Prepruning 184
- Principal Component Analysis (PCA) 70
- Principal components 64
- Projected database 292
- Pruning decision tree 184
- Radial visualization (Radviz) 460
- Random variable 150
- Rao's coefficient 256
- Ratio scale 27
- Ratios 35
- Receiver operating characteristic (ROC) 130
- Receiver operating characteristic (ROC) curve 130
- Regression 3,102
 - Logistic 157
 - Linear 150
 - Nonlinear 153
 - Multiple 152
- Regression equation 150
- Resampling methods 124, 150
- Resubstitution method 125
- Return on investment (ROI) chart 129
- Risk functional 92
- Rotation method 125
- RuleExchange 408
- RuleGeneralization 408
- RuleSpecialization 408
- RuleSplit 408
- Sample 6
- Sampling 81
 - average 82
 - incremental 82
 - inverse 83
 - random 82
 - stratified 83
 - systematic 82
- Saturating linear function 203
- Scaling 8
- Scatter plot 451
- Schemata 399
 - fitness 401
 - length 401
 - order 400
- Scientific visualization 449
- Scrubbing 15
- Sensitivity 98
- Sequence 311
- Sequence mining 311
- Sequential pattern 351
- Similarity measure 68, 253, 349
- Simple matching coefficient (SMC) 256
- Single-link method 260
- Smoothing data 212
- Spatial data mining 357
 - Autoregressive model 359
 - Spatial outlier 359
- Specificity 131
- Split-info function 182
- SQL (Structured query language) 17
- SSE (Sum of squares of the errors) 150
- Standard deviation 34, 43, 144
- Star display 453
- Statistics 4
- Statistical dependency 91
- Statistical inference 140
- Statistical learning theory (SLT) 93
- Statistical methods 105
- Statistical testing 142
- Stochastic approximation 97

- Stopping rules 98
- Strong rules 282
- Structure identification 5
- Structural risk minimization (SRM) 96
- Summarization 3, 103
- Supervised learning 99
- Support 282, 291, 339, 354, 419
- Survey plot 452
- Survival data 41
- Synapse 201
- System identification 5

- Tchebyshev distance 422
- Temporal data Mining 343
 - Sequences 344
 - Time series 344
- Test of hypothesis 142
- Testing sample 119, 192
- Text analysis 316
- Text database 316
- Text mining 316
- Text-refining 319
- Time lag (time window) 37
- Time series, multivariate 40
- Time series, univariate 40
- Training sample 94, 214, 239
- Transduction 88
- Traveling salesman problem (TSP) 402
- Trial and error 6
- True risk functional 94

- Ubiquitous data mining 356
- Underfitting 97
- Unobserved inputs 13
- Unsupervised learning 99

- Value reduction 73
- Variables 12
 - continuous 27
 - discrete 27
 - categorical 27
 - dependent 12
 - independent 12
 - nominal 27
 - numeric 26
 - ordinal 28
 - periodic 28
 - unobserved 13
- Variance 61
- Variogram cloud technique 359
- Vapnik-Chervonenkis (VC) theory 93
- Vapnik-Chervonenkis (VC) dimension 95
- Visual clustering 466
- Visual data mining 449
- Visualization 448
- Visualization tool 450
- Voronoi diagram 119

- Web mining 300
 - content 302
 - HITS(Hyperlink-Induced Topic Search) algorithm 306
 - LOGSOM algorithm 308
 - path-traversal patterns 310
 - structure 304
 - usage 304
- Web page content 301
- Web page design 301
- Web page quality 302
- Web site design 301
- Web site structure 302
- Widrow-Hoff rule 208
- Winner-take-all rule 222, 227

- XOR problem 206