Index

A
Acoustic-Optic Tunable Filters (AOTF) 110
applied ontologies 161
Apriori property 2
association rules 4, 23
attribute selection 252
auxiliary feature functions 325
Auxiliary SCRF (ASCRF) 311, 325
available-case analysis 74
avatars
  achieving autonomous actions 367, 372
  behavioral features 367-368
  complex behaviors 367, 373
  simple actions 367, 373
Averaged One-Dependence Estimators (AODE) 77

B
Back-Constrained GPLVM (BC-GPLVM) 288
Bagging (BAG) 37, 46
bagging variance 43
Balanced-GPDM (B-GPDM) 290
Bayesian Linear Discriminant Analysis (LDA) 132
Bayesian Multinets (BM) 82
Bayesian Network Augmented Naïve-Bayes (BAN) 79
Bayesian Network (BN) 72
Bayesian Network Classifiers (BNC) 72
Bayes theorem 127
boosting 37
Broker Agent (BA) 272

C
candidate patterns 4
  generation of 9
  growth strategy 10
characteristic support 8
chi-square statistic (CHI) 252
Combined Agents 273
Computer Aided Design (CAD) 265-266
Computer Aided Sketching (CAS) 265-266
computer vision system 129
Conditional Gaussian Network (CGN) 86, 88
conditional independence 73
Conditional Probability Tables (CPT) 73
Context-Free Grammar (CFG) 344
coupled HMMs (CHMMs) 314
crater auto-detection 148
Crater Detection Algorithms (CDA) 146-147, 149

D
DAMIART project 20
Decision Trees (DT) 45
density based estimation 44
dependency networks (DNs) 82
digital elevation models (DEMs) 148
dimensionality reduction (DR) approach 207, 252
directed acyclic graph (DAG) 73
directed edges 162
directed hypergraphs 162
direct semantic computing 311
discrete Markov Decision Process (MDP) 372
discretization 84
dissimilarity maps 219
distributed control system (DCS) 219
dr-based motion modeling 286
drive feature functions 325
dual perturb and combine algorithm 37
Dynamic Bayesian Networks (DBNs) 83, 313
dynamic model of transitions 216

E
environmental science 93
estimate SAbias 42
estimate SAv 42
### Index

- **Expectation Maximization (EM)** 38, 249-250, 255
- **explicit semantic modeling** 311

#### F

- factorial HMMs (FHMMs) 314
- fault-tolerant control 188
- Feature Agent (FA) 272-273
- feature selection 252
- Finite State Machine (FSM) 369
- Forest Augmented Naïve Bayes (FAN) 76
- Frequent Pattern-tree (FP-tree) 5
- Full Bayesian Network Classifier (FBNC) 79
- Fuzzy Inference Systems (FIS) 213

#### G

- gait manifold 284, 292
- GAR Pruning (GARP) 24
- Gaussian distribution 85
- Gaussian Process Dynamical Model (GPDM) 286, 288
- Gaussian Process Latent Variable Model (GPLVM) 286-287, 308
- Generalized Additive Model (GAM) 47
- Generalized Association Rules (GARs) 21
- GIDeS system 268
- Grammatical Evolution guided by Reinforcement (GER) 340

#### H

- Hidden Markov Models (HMMs) 318
- Hidden Naïve Bayes (HNB) 78
- Hidden One-Dependence Estimator (HODE) 79
- Hierarchical Reinforcement Learning (HRL) 367
- hybrid algorithm 81
- hyperarc 162
- hyperspectral image systems 109
- hyperspectral vision system 112
- hypothesis stability 40

#### I

- image acquisition 129
- image analyzer 161, 166-167
- image synthesizer 161, 169
- IMDb dataset 25
- Information Gain (IG) 252
- integrity template 326
- interestingness 23
- Interface Agent (IA) 271
- inverse transduction 41
- i-th candidate patterns 4

#### J

- Joint Gait-Pose Manifold (JGPM) 283-284, 293

#### K

- kernel density estimation 87
- k-Nearest Neighbours (KNN) 46
- knowledge representation languages 162

#### L

- Lamarck Effect 344
- landmark refinement 64
- Lazy Bayesian Rules (LBR) 77
- LCV (local cross-validation) reliability estimate 43
- length prediction templates 323
- Linear Regression (LR) 45
- linguistic analyzer 161, 170
- Liquid Crystal Tunable Filter (LCTF) 110
- LL-GPDM 290
- local leave-one-out (LOO) procedure 43
- Locally Weighted Regression (LWR) 47
- local sensitivity analysis 41

#### M

- machine learning algorithm 370
- Markov chain Monte Carlo (MCMC) 371
- Markov Decision Processes (MDPs) 370
- Markovian templates 322
- Markov processes 370
- mid-level keywords detection 327
- Minimum Description Length 58
- missing values problems 7
- model-independent approaches 36
- model validation 297
- Multi-Channel SHMM (MCSHMM) 311, 321
- multi-dimensional BNCs (MDBNCs) 80-81
- Multidimensional Scaling (MDS) 222
- multilayer perceptron (MLP) 115
- Multi-Layer Perceptron (MLP) 190

#### N

- Naïve Bayes (NB) 47, 74
- Natural Language Processing (NLP) 177
- network training 253
- Neural Network (NN) 45, 193
Index

NL-text synthesis 161, 175, 185
numerical data 3

O
Odds Ratio (OR) 252
ontologies 19

P
PaleoSketch recognizer 266
plane geometry 161, 163
Point Distribution Model (PDM) 57, 66-67
pomegranate 130
Preprocessing Agent (PA) 272
Primitive Agents 273
Principal Component Analysis (PCA) 132, 222
Probabilistic Decision Graphs (PDGs) 83
Pruning by Ancestral Rules (PAR) 24
pure filter algorithm 80
pure wrapper algorithm 81

Q
Q tree 341
quality measures
for association rules 23

R
Radial Basis Function (RBF) 197, 249-250, 262, 287, 294
Random Forests (RF) 47, 237
Regression Trees (RT) 45
regular structure templates 322
Reinforcement Learning (RL) 340, 367, 371
Result of Linear Translation (RLT) 173
Rotten Tomatoes (RT) dataset 25

S
satsuma 134
Scaled-GPLVM (S-GPLVM) 289
Segmental Hidden Markov Models (SHMMs) 310, 314, 319
Segmentation Condition Random Field (SCRF) 310
Segmentation CRF (SCRF) 314
Self-Organizing Map (SOM) 206, 208, 227
semantic analyzer 173
semantic space 315
sensitivity analysis 40
shape correspondence error 59
similarity template 326
Sketch-Based Interfaces and Modelling (SBIM) 266
SKETCH system 268
special structure templates 323
Spherical Harmonics 58
Superparent One-Dependence Estimators (SPODEs) 77
Super-Parent TAN (SP-TAN) 77
supervised learning 36
Support Vector Machines (SVM) 46

T
tabular structured data 3, 7
TCVD (Tangent and Corner Vertices Detection) algorithm 272
TEDDY system 268
template landmarks 60
topology consistency 60
Torus-Constrained JGPM (JGPM-II) 295
Torus-like JGPM (JGPM-III) 295-297, 305
transduction 39
transductive methods 39
Transductive Support Vector Machine (TSVM) 251
Tree Augmented Naïve Bayes (TAN) model 76

U
undirected edges 162
undirected hypergraphs 162

V
virtual humans 368