

Index

A

Abstract Data Type (ADT) 193-194, 215, 242
 agent systems
 ALICE 72
 CHILD 72, 86, 135, 138, 141, 260, 263, 267, 269, 272-275
 continual learning 72
 perpetual learning agent (PeLA) 73
 Air Traffic Control System (ATCS) 179, 279
 ant colony algorithm 332-333, 340-341
 Ant-Cycle 339
 architectural complexity 177-179, 181-182, 185, 187, 189
 artificial neural networks (ANN) 45
 artificial neuron node 159
 Association rule mining 132, 142
 automated image analysis tools 44
 automatic pattern generation 88-89, 92, 95

B

bag-of-visual-words model 19, 23
 bilateral teleoperation 283-284, 297
 binary tree (B-Tree) 260, 262, 279
 bioinformatics 374-375, 384-385
 box-counting dimension (BCD) 300
 Brain-computer interface (BCI) 57-58, 67-68

C

causal inference 103, 107-108, 110, 134
 causality modeling
 binary causation 104-106, 109
 chain causation 105-106
 loop causation 105-106, 108
 n-nary causation 105-106
 static causation 106
 causation modeling
 dynamic causation 106-107

Circular Hough Transform (CHT) 310
 cognitive complexity 174-177, 179-182, 185, 187-191
 cognitive computing 1-2, 13, 15, 56, 103, 112-113, 171, 212, 229, 258, 280, 352
 cognitive informatics 1-2, 13-15, 44, 54, 86, 103-104, 110, 113, 130-131, 134, 142, 171, 190-191, 211-213, 228-230, 239-240, 242, 257-259, 279-281, 298, 331, 352-353, 374
 Cognitive Learning Engine (CLE) 1, 3, 13
 cognitive mental load model
 perception model 149, 152
 cognitive penetrability 114-115
 Collaborative (or Community) Question Answering (CQA) 88
 Combinatorial biology 376
 Computing with words (CWW) 113, 134, 212, 230, 259, 280
 concept algebra 1-3, 5-6, 12-15, 113, 134, 212, 230, 259, 280
 conditional entropy 301, 315
 constellation model 17
 Constructive Quality Model (COQUALMO) 359
 Controller Area Network2 (CAN) 147
 cost of quality model 362
 crater detection algorithm 308, 310

D

data quality 86, 132, 134, 139, 142, 144
 decision trees 261, 315
 Deduction 104, 109, 136
 Digital Space (DS) 317-318
 discrete-event system 233
 discriminative models 17
 doubly-linked-circular (DLC) model 215, 228
 doubly linked circular list (DLC-List) 216
 dual-user teleoperation system 284
 dynamical systems 231-233, 239, 343, 353

E

entropy quad-trees 299-300, 308, 314-315
 Eukaryotic transcriptional regulation 377
 event-related desynchronization (ERD) 58
 evolutionary algorithm 31
 eye-movement model 149

F

false causality 103-104, 110-112
 FAQ retrieval 90-91, 101
 fault recognition 158-160, 162-163, 171
 Feature selection 43-47, 51-52, 55-56, 67-68
 feature selection lattice 46
 file processes
 clear file 207-208
 close file 205
 copy file 207-208
 create file 202
 delete file 208-209
 empty test 205, 223, 225, 275-276
 file rename 206-207
 full test 206, 225-226, 276-277
 list release 226-227
 node creation 220-221, 270
 node deletion 223, 225
 open file 203, 205
 save file 205-206
 FilesST 196-202, 209
 force feedback 283-284, 297
 force-reflecting bilateral control 283
 Formal concept analysis 134, 143
 Formal Knowledge Representation System (FKRS)
 1-3, 13
 Formal logic inferences 104
 functional complexity 174-180, 183, 185-188
 Fuzzy Logic 104, 112-113, 134, 143-144

G

generative models 17
 gene regulation 375, 377, 383
 Generic Cabling
 bridge 333
 connection group 333
 device 333
 generic image classification 16-18, 29
 Genetic Algorithm (GA) 43-44
 genetic algorithms 47, 56, 355-357, 361, 363, 371-372
 global optimum 31, 37

H

hash table 196
 high entropy threshold 312-313
 higher dimensional chaotic systems 344
 higher order (nonlinear) neural units (HONU) 344
 Histograms of Oriented Gradients (HOG) 19
 human-aware environment 317, 319-320
 hybrid data object 194, 215, 242, 261

I

i2Learning See inconsistency-induced learning
 impact defects 361-362, 365, 369
 inconsistency
 anti-inverse inconsistency 116, 127
 contradictory inconsistency 116, 125-127
 granularity 119
 incompatible inconsistency 115, 122, 124
 locality 114-115, 117-120, 122, 129-130
 inconsistency-induced learning 70-71, 74-76
 Induction 104, 109, 138, 171
 Inductive logic programming (ILP) 79

J

JPEG compression 308

K

knowledge base (KB) 74
 Knowledge representation 1-5, 7, 11, 13-14, 85, 133, 144
 knowledge representation models 4, 133

L

Lawrence architecture 283-285
 lexical databases 1
 list l 216

M

machine-enabled inference 104
 machine learning 1, 3, 14-15, 44, 48, 56, 64, 70, 85-86, 100, 144, 341, 356-357, 371, 373
 Magnetic resonance (MR) imaging 43
 manager node 265
 master and slave 283-284, 286-287, 292-293, 296
 Melvin I
 coding 166
 design 163
 training 164

Train Mode 166
Use Mode 167
minimum mental load methodology 145
motor imagery 57-59, 67-69
multi-dimensional data objects 241-242, 257
multilateral shared control architecture 283-285,
 289, 291-292, 294-298
multi-objective flexible job shop scheduling 333
mutual cognition model 318
mutual cognition processing 319

N

name entity recognition (NER) 92, 95
natural language parsing 214, 216
natural language processing (NLP) technologies 1
neural network 54, 58, 158-160, 163-166, 170, 172,
 343-345, 348, 353
neuromotor prosthesis 58
n-nary trees 261, 264
nonconventional neural architectures 343, 352
nonlinear neural networks (NN) 344
normalized system 265

O

Ontology study 134
operant conditioning 58
Order analysis 162
ordered trees 261
organization trees 261
oriented trees 261

P

parse trees 261
Particle swarm optimization (PSO) 31
Particle Swarm Optimization (PSO)
 D-dimensional search space 32, 35
 global optimum 31, 37
 hybrid boundary condition 32, 41
 random velocity method 32
passive four-channel architecture 283-294, 296-297
pattern matching 88-90, 92-93, 98-99, 384
Perceptual function 319, 329-330
perpetual learning agents 70-71, 84
personal online banking subsystem (POBS) 367
Petri Net
 1-safe Petri Nets 234, 236, 239
 discrete-event processes 232
 Incidence Matrix 239
 Markings 232

non-bounded 231-232, 236, 239
transition vector 236-239
plasticity 114-115, 129
Polymorphism 80, 211, 229, 258, 279
polynomial neural network architecture 345
Promoter modules 375-376, 384

Q

QsaBC 31-32, 35-38, 40-41
Quadratic Neural Network (QNN) 344
quadratic neural unit (QNU) 343
qualitative reasoning 145-147, 156-157
Question answering (QA) 90

R

Real Space (RS) 317-318
real-time operating system (RTOS+) 191-193, 211,
 213-214, 228-230, 241, 257, 259-260, 278-279,
 281
Real-Time Process Algebra (RTPA) 1-2, 14, 177,
 190, 193-194, 212, 214-215, 229, 241-242,
 257-258, 260-261, 279
Required Reliability (RELY) 361
RS cognition 317, 319, 329

S

Scale Invariant Feature Transform (SIFT) 18
Semantic computing 15, 86, 113, 134, 144, 191,
 212, 230, 259, 280
semantic network 132-138, 140-142
semantic question patterns 88-89, 92, 97
Software Cognitive Complexity Analysis Tool (SC-CAT) 174, 176, 188
space teleoperation 283, 289, 291, 296, 298
Sparse Representation based Classification (SRC)
 algorithm 18
sparse signal representation 17
stakeholder value propositions (SVPs) 358
statistical pattern recognition (SPR) 45
structure processing 88-89, 92, 95, 99
Support Vector Machines (SVMs) 44
support vector machine (SVM) 16-17, 43, 58-59
SVM kernel
 RBF kernel 53, 64
SVM kernel functions
 linear kernel 53, 64, 66
Symbiotic Computing 317-318, 327, 330-331
System Organization Tree (SOT) 265

T

Tagger Ontology 90-92, 94-97
Text REtrieval Conference (TREC) 90
transcription factors (TFs) 374, 376

U

unified data model (UDM) 4, 179, 181, 194, 215, 243, 261
Unified Medical Language System (UMLS) 140
unified process models (UPM) 3-4, 6-10, 182, 194, 198-209, 214-215, 219-228, 241-243, 249-254, 260-262, 269-277
Universal Array
 element retrieval process 252
 logical model 244
 mathematical model 244, 257

physical model 241, 244
release process 252, 254
uniqueness 244

universal function approximators 344
User-Interactive Question Answering (UIQA) 88

V

value-based software engineering 355-356, 371-373
virtual reality 291

W

WiiRemote controller 323

Y

Yahoo! Answers 88-89