

Index

A

- ABC algorithm, *see* Artificial Bee Colony (ABC) algorithm
- Adaptive threshold algorithm, 170
- AI, *see* Artificial intelligence (AI)
- Air conditioning process, 1, 2
 - FOPDT model, 5
 - optimization procedure, 4
 - relative dead time, 6
- Allocation algorithm design, 144, 145
- Allocation phase, 154
- AMIGO method, 1, 6, 7
- ARIMA model, *see* Autoregressive integrated moving average (ARIMA) model
- Artificial Bee Colony (ABC) algorithm, 142
 - EAs, 12
 - employed bees, 13
 - experimental results, 16–18
 - experimental setting, 16
 - initialization, 12–13
 - MATLAB, 16
 - onlooker bees, 13, 15
 - Otsu segmentation function, 12–15
 - scout bees, 13, 15, 16
 - separable functions, 12
 - types, 12
- Artificial intelligence (AI), 61–62
- Auction model, 144
- Autocorrelation coefficient, 93
- Autonomous Underwater Vehicle (AUV), 53
- Autoregressive integrated moving average (ARIMA) model, 24, 90
- AUV, *see* Autonomous Underwater Vehicle (AUV)

B

- BI, *see* Brain intelligence (BI)
- Bidding phase, 153
- Bi-level segmentation method, 11
- Blind face retrieval, mobile users
 - backup, 119, 120
 - cloud storage space, 119
 - face detection, 120
 - face label matching, 120
 - face recognition, 120
 - face recognition and label vector, 124
- Hamming distance, 121
- kNN scheme, 121
- photo management module, 119
- privacy preserving computation, 121
- SCiFI, 120
- secure face detection, 123–124, 126
- secure face label matching, 124–125
- security model
 - detection privacy, 122
 - encryption-before-outsourcing schemes, 122
 - “honest-but-curious” model, 121
 - matching privacy, 122
- system architecture, 121, 122
- Viola–Jones type face detector, 120, 125
- Brain intelligence (BI), 62
- Brute-force attack
 - key spaces, 113, 114
 - secret keys, 113
 - sensitivity, 114

C

CAGR, *see* Compound annual growth rate (CAGR)
 Cartesian coordinate system, 151
 CESC, *see* Computing contrast feature maps (CESC)
 CF algorithm, *see* Collaborative filtering (CF) algorithm
 Cloud computing, 21, 87, 141
 CloudSim, 26, 98
 Clustering-based processing, 170
 CNN, *see* Convolutional neural networks (CNN)
 Cohen-Coon (C-C) method, 1, 6, 7
 Collaborative filtering (CF) algorithm, 60, 68
 Communication cost, 142
 Compound annual growth rate (CAGR), 108
 Computing contrast feature maps (CESC), 204
 Confidence score, 56
 Constant-time algorithm, 88
 Convolutional neural network (CNN), 55, 76
 Corner-surround constrast (CSC), 204–205
 Covariance matrix, 133, 157
 CSC, *see* Corner-surround constrast (CSC)

D

Damaging rate function, 152
 Darknet19, 80
 2D Arnold's Cat map, 109–110
 Data acquisition, 77–78
 Data enrichment
 brightness transforms, 79
 Gaussian noise, 79
 sensitivity, 78
 training sets, 78
 Decision phase, 153
 Decryption, 115, 116
 Deep-learning algorithms, 76, 82
 Degree of freedom (DOF), 158, 160
 Department of Defense, 181
 DJI FlameWheel 450, 183
 1D logistic map, 109
 1D Lu maps, 110
 3D Lu maps, 113
 DOF, *see* Degree of freedom (DOF)
 Doppler frequency, 160–162, 165
 Double auction VM migration approach
 ABC, 142
 cloud computing, 141
 communication cost, 142
 energy consumption, 142
 genetic algorithm, 142
 migration cost, 142

QoS, 142
 system model, 142–143
 VMM-DAM design
 allocation algorithm design, 144, 145
 auction model, 144
 payment scheme, 145
 VMs-GSA design, 143–144
 3D textured model encryption
 brute-force attack
 key spaces, 113, 114
 secret keys, 113
 sensitivity, 114
 CAGR, 108
 cryptographic characteristics, 109
 2D Arnold's Cat map, 109–110
 and decryption, 115, 116
 1D logistic map, 109
 1D Lu map, 110
 high-level chaotic maps, 109
 multi-level model
 3-dim textured model, 110, 111
 polygons encryption, 111–112
 textures encryption, 112
 vertices encryption, 110–111
 point cloud encryption, 108
 simulation results, 112–113
 statistic attack
 histogram analysis, 114, 115
 occupied position distribution, 115
 surface model, 108
 virtual reality technology, 107

E

EAs, *see* Evolutionary algorithms (EAs)
 Eigenvalue decomposition, 133
 Eigenvalues curve, 172
 Employed bees, 13
 Energy analysis, 101–102
 ERGAS, *see* Relative global dimension synthesis error (ERGAS)
 Evolutionary algorithms (EAs), 12, 16, 17
 External-based social-trust networks
 aggregation strategies, 62, 65–66
 degree of trust, 64
 frame and formula, 62, 63
 GRITrust algorithm, 66
 LVD, 64
 LVTP, 64–65

F

Face detection, 120
 Face label matching, 120

Face recognition, 120
 and label vector, 124
 Feature augmentation, 194
 Feature extraction, 132–133
 Feature integration theory (FIT), 202
 First order plus dead time (FOPDT) model, 5

G

Gauss equation, 172
 Gaussian filter, 133
 Gaussian noise, 79
 5G-Csys platform, 34
 Genetic algorithm, 142
 closed-loop system, 3
 crossover and mutation, 4
 elimination and duplication, 3–4
 encoding and population initialization, 3
 fitness and cost function, 3
 optimization procedure, 4–5
 Global contrast (GC), 205
 Gram–Schmidt fusion method, 33, 37
 Graph theory, 181
 Greedy selection strategy, 13
 Group preference model, 60
 Group recommendation robotics (GRR)
 CF algorithm, 60, 68
 evaluation method description, 67
 experimental data, 67
 external-based social-trust networks
 aggregation strategies, 62, 65–66
 degree of trust, 64
 frame and formula, 62, 63
 GRITrust algorithm, 66
 LVD, 64
 LVTP, 64–65
 group preference model, 60
 individuals' preferences aggregation, 60
 random sampling, 70, 71
 social impact, 59
 social network recommendation robotic,
 61–62
 social-trust network utilization ratio, 69–70
 Group recommender Involve Trust (GRITrust)
 algorithm, 66, 69
 GRR, *see* Group recommendation robotics
 (GRR)
 5G ultra-dense cellular networks, 34

H

Haze removal, deep-sea images, 54–55

Heterogeneous multi-robot system
 Cartesian coordinate system, 151
 damaging rate function, 152
 experimental results, 154, 155
 location, 151
 MRTA, 149
 SAR, 150
 static auction algorithm
 allocation phase, 154
 bidding phase, 153
 complementary slackness condition,
 153
 complexity, 153
 conditions, 152
 decision phase, 153
 iterative process, 154
 stochastic working environments, 150
 Histogram analysis, 114, 115
 Human visual system (HVS), 201, 202
 Hungarian algorithm, 154, 155
 Hybrid Markov model, 22

I

IHS, *see* Intensity–hue–saturation (IHS)
 Image information index, 34, 37
 Image segmentation technique, 11
 Image spatial information retention, 35, 37
 Image spectral information retention, 35–36,
 38
 Impervious surface distribution, Nantong,
 China
 environmental impact, 41
 ISP distribution diagram
 fraction image, 45, 47
 types, 45, 48, 49
 linear spectral mixture analysis model
 four pixels images, 45, 46
 MNF, 43
 pixel extraction, 43–45
 location, 42
 precision verification, 47–49
 regression tree model, 41
 Impervious surface percentage (ISP)
 distribution diagram
 fraction image, 45, 47
 types, 45, 48, 49
 Information cognitive system, 34
 Information entropy, 34
 Intelligent video surveillance (IVS) technology,
 129
 Intensity–hue–saturation (IHS), 33
 Iterative process, 154

J

JAMSTEC E-library of Deep-sea Images (J-EDI), 54
 Japan Agency for Marine-Earth Science and Technology (JAMSTEC), 53, 54
 “Jitter” phenomenon, 22

K

Kernel weight function, 55
 K-means clustering, 81–82
 k-nearest neighbor (kNN) scheme, 121
 K-order mixed Markov model, 25, 26
 algorithm design, 96–98
 autocorrelation coefficient, 93
 computer resources, 91
 ordinary single-order Markov model, 92
 Pearson correlation coefficient, 92, 93
 random process, 91
 time-homogeneous discrete-time Markov model, 92
 transition probability, 91
 Koschmieder model, 54

L

Lambda via disagreement (LVD), 64, 68
 Least-squares method, 5
 Linear correlation coefficient, 92
 Linear spectral mixture analysis model
 four pixels images, 45, 46
 MNF, 43
 pixel extraction, 43–45
 Load-balancing system, 90
 Local regression robust (LRR) detection
 algorithm, 22, 88
 LOCUST Project, 181

M

Mapping function, 194–196
 Marine organisms tracking
 AUV, 53
 CNN, 55
 dataset, 53–54
 deep-sea videos, 54
 experimental results, 56–58
 haze removal, deep-sea images, 54–55
 Markov chain process model, 24, 27, 88, 90
 Markov transition probability, 25
 MATLAB, 16, 33
 Maximum likelihood rule, 25
 Mean average precision (MAP), 77

Mean gradient, 35
 Minimum noise fraction (MNF), 43
 Modified Koschmieder model, 54
 Motion analysis method, 170
 Multi-level segmentation method, 11
 Multi-robot task allocation (MRTA), 149
 Multi-scale detection training, 83

N

NDVR, *see* Near-duplicate video retrieval (NDVR)
 Near-duplicate video cleansing method
 dirty data, 129
 execution time, 137
 feature extraction, 132–133
 GIST, 135
 IVS technology, 129
 key frame extraction, 131–132
 low-level feature extracting algorithm, 130
 LSH and SNM, 130–131, 134–135
 NDVR, 130
 objective function, 131
 results, 135–138
 SURF, 135
 video data quality, 129
 Near-duplicate video retrieval (NDVR), 130
 Nearest-neighbor diffusion pan sharpening
 method, 34, 37
 Nyquist curves, 6, 7

O

Odroid-Xu4 hardware, 184
 Onlooker bees, 13, 15
 Open Compute Project (OCP), 88
 OpenStack, 22, 88
 Otsu segmentation algorithm, 12
 analysis, 14–15
 vs. EA results, 16, 17
 gray level, 13
 optimal thresholds, 14

P

Pan-sharpening transform method, 33
 PCA, *see* Principal component analysis (PCA)
 Pearson correlation coefficients, 92, 93, 95
 Person re-identification
 feature augmentation, 194
 feature representation, 19, 191
 mapping function, 194–196
 rank-k recognition rate, 196

subspace/metric learning, 191, 192
 VIPeR dataset, 196, 197
 XQDA metric learning method, 191, 192
 covariance matrices, 193
 projection matrix, 193–194
 zero-mean Gaussian distribution, 193
 Pixhawk hardware, 184
 Polygons encryption, 111–112
 Population-based algorithm, 12
 Power usage effectiveness (PUE), 21–22
 Principal component analysis (PCA), 33, 37, 172, 173
 Proportional–integral–derivative (PID) controllers
 air conditioning process, 1
 AMIGO method, 1, 6, 7
 characteristics, 2
 Cohen-Coon (C-C) method, 1, 6, 7
 genetic algorithm, 3–5
 load disturbance attenuation, 6
 load disturbance response, 6
 normalized controller parameters, 2
 Nyquist curves, 6, 7
 plant parameters, 2
 quantitative analysis, 7
 relative dead time, 6
 robustness index, 8
 set point response, 6
 temperature conditioning process, 6
 transfer function, 6
 tuning formulas, 1
 control actions variation, 6, 7
 function coefficients, 5, 6
 least-squares method, 5
 optimization procedure, 5
 parameters, 5, 6, 8
 test batch, 5
 two degrees-of-freedom, 2
 Ziegler–Nichols (Z-N) method, 1, 6, 7
 PUE, *see* Power usage effectiveness (PUE)

Q

Quadratic discriminant analysis metric learning
 Quality of service (QoS), 102, 142

R

Rank-k recognition rate, 196
 Relative dead time, 5, 6
 Relative global dimension synthesis error (ERGAS), 35–36

Remote sensing image fusion method
 Brovey method, 33
 data caching and computation offloading, 34
 deep feature learning system, 34
 deviation index, 35
 ERGAS, 35–36
 experimental data, 36
 experimental results, 36–38
 Gram–Schmidt method, 33
 IHS, 33
 information cognitive system, 34
 information entropy, 34
 mean gradient, 35
 nearest-neighbor diffusion pan sharpening method, 34
 pan-sharpening transform method, 33
 PCA, 33
 spatial frequency (Sf), 35
 standard deviation, 34
 wavelet transform, 33
 WorldView-2 image, 34
 Resource management program, 21
 Resource utilization, 22
 Robustness index, 8
 Root mean square error (RMSE), 67–70
 Rule-based group consensus framework, 61

S

Scale-invariant feature transform (SIFT) algorithm, 170
 SCiFI, *see* Secure computation of face identification (SCiFI)
 Scout bees, 13, 15, 16
 SDA, *see* SmartData Appliance (SDA)
 Search and rescue (SAR), 150
 Secondary filter keyframes extraction algorithm
 adaptive threshold algorithm, 170
 adaptive threshold calculation, 173–174
 clustering-based processing, 170
 coal mine, 171
 coal technology, 169
 experimental results and analysis, 176–179
 image eigenvalue calculation, 172–173
 motion analysis method, 170
 secondary filtration process, 174–176
 SIFT algorithm, 170
 target detection, 170
 Top-K, 174
 video sequence moving target detection, 171

Secure computation of face identification (SCiFI), 120

Secure face detection, 123–124, 126

Secure face label matching, 124–125

Self-regulating index, 5

Service level agreement (SLA), 22, 102–104

Service level agreement violation (SLAV) analysis, 102–104

SIFT algorithm, *see* Scale-invariant feature transform (SIFT) algorithm

SmartData Appliance (SDA), 26

Social centrality (SC), 61

Social network recommendation robotics, 61–62

Social similarity (SS), 61

Social-trust network utilization ratio, 69–70

Space-time autoregressive (STAR) cascade algorithm

- anti-interference target, 160–162, 166
- beam-Doppler space, 162
- flowchart, 164
- regression coefficient, 163

covariance matrix, 157

DOF, 158, 160

inhomogeneous clutter power, 157, 167

input target signal and interference parameters, 164, 165

multi-channel radar detection, 157

outlier-resistant method, 158

PAMF, 157

residual filter, 157

ROF, 160

space-time steering vector, 159

training samples, 158–159

vector linear predictive filter, 157

whitening filter, 159

SS, *see* Social similarity (SS)

Standard deviation, 34

STAR, *see* Space-time autoregressive (STAR)

Static auction algorithm

- allocation phase, 154
- bidding phase, 153
- complementary slackness condition, 153
- complexity, 153
- conditions, 152
- decision phase, 153
- iterative process, 154

Statistics-based approach, 24

Subspace/metric learning, 191, 192

Support vector machine (SVM), 76, 206

T

Temperature conditioning process, 6

Textures encryption, 112

Thomas–Kilmann instrument, 61

Threshold-based heuristic methods, 23

Threshold-based load detection algorithm, 88, 103

Threshold-based segmentation method, 11, 12

Time-homogeneous discrete-time Markov chain (DTMC), 92, 93

Time-separated discrete-time Markov chain, 24

Trust relationship (TR), 61

U

Unmanned aerial vehicles (UAV)

- bearing rigidity, 181
- control algorithm, 186
- Department of Defense, 181
- experiment environment, 186, 188
- experiment scene, 186, 188
- flow chart, 186, 187
- formation control, 181
- graph theory, 181
- LOCUST Project, 181
- target trajectory, 186, 189
- velocity control, 187
- Vicon system, 181–182
 - DJI FlameWheel 450, 183
 - experiment and setup, 183
 - hardware architecture, 182
 - Odroid-XU4, 184
 - Pixhawk, 184
 - software architecture, 184–185

V

Vehicle logo detection

- algorithm, 76–77, 83, 84
- data acquisition, 77–78
- data enrichment
 - brightness transforms, 79
 - Gaussian noise, 79
 - sensitivity, 78
 - training sets, 78
- detection effect, 83
- feature extraction, 76
- improved algorithm, 84, 85
- locations, 76
- MAP value, 84
- research significance, 75

- training and testing samples, 83
 - training samples, 77
 - YOLOv2 algorithm
 - competitive advantage, 80–81
 - Darknet19, 80
 - K-means clustering, 81–82
 - multi-scale detection training, 83
 - pre-training model, 82
 - VGG16 network, 80
 - Vertices encryption, 110–111
 - VFH, *see* Viewpoint feature histogram (VFH)
 - VGG16 network, 80
 - Vicon system, 181–182
 - DJI FlameWheel 450, 183
 - experiment and setup, 183
 - hardware architecture, 182
 - Odroid-XU4, 184
 - Pixhawk, 184
 - software architecture, 184–185
 - Video sequence moving target detection, 171
 - Viewpoint feature histogram (VFH), 114, 115
 - Viola–Jones type face detector, 120, 125
 - ViPeR dataset, 196, 197
 - Virtual machines
 - algorithm, 26
 - ARIMA model, 90
 - cloud computing, 21, 87
 - constant-time algorithm, 88
 - control node scheduling, 22
 - cyclical allocation, 23–24
 - decision-making, 89
 - dynamic consolidation, 22
 - dynamic mode, 89
 - dynamic virtual machine integration, 23
 - energy analysis, 101–102
 - energy consumption, 27–29
 - experimental design, 26–27
 - hybrid Markov model, 22
 - integration technologies, 89
 - “jitter” phenomenon, 22
 - K*-order mixed Markov model
 - algorithm design, 96–98
 - autocorrelation coefficient, 93
 - computer resources, 91
 - ordinary single-order Markov model, 92
 - Pearson correlation coefficient, 92, 93
 - random process, 91
 - time-homogeneous discrete-time
 - Markov model, 92
 - transition probability, 91
 - load-balancing system, 90
 - LRR detection algorithm, 22, 88
 - Markov chain model, 88, 90
 - migration, 27, 28, 89–90
 - quantity analysis, 100, 101
 - model establishment, 96
 - DTMC, 93
 - Markov transition probability, 94
 - Pearson correlation coefficients, 95
 - transition probability matrix, 95
 - OCP, 88
 - OpenStack, 22, 88
 - power resource consumption, 22
 - PUE, 21–22
 - resource management program, 21
 - resource utilization, 22
 - simulation process, 98–100
 - simulation tools, 98
 - SLA analysis, 22, 102–104
 - SLAV analysis, 102–104
 - static mode, 89
 - statistical analysis, 90
 - statistics-based approach, 24
 - system model, 24–26
 - threshold average load detection algorithm, 88
 - threshold-based heuristic methods, 23
 - Virtual reality technology, 107
 - VMM-DAM design
 - allocation algorithm design, 144, 145
 - auction model, 144
 - payment scheme, 145
 - VMs-GSA design, 143–144
- W**
- Wavelet fusion method, 37
 - Wavelet transform, 33
 - Weighted linear multiple kernel learning (WLMKL) framework, 202
 - CESC, 204
 - CSC, 204–205
 - experimental setting, 209
 - FIT, 202
 - GC, 205
 - HVS, 201, 202
 - image representation, 203–204
 - optimization, 207–208
 - primal learning problem, 206–207
 - results and analysis, 209–211
 - saliency formulation, 205–206
 - visual applications, 202
 - visual saliency detection, 202, 203
 - Whitening filter, 159

X

- XQDA metric learning method, 191, 192
- covariance matrices, 193
- projection matrix, 193–194
- zero-mean Gaussian distribution, 193

Y

- YOLO method
 - frame rate multiplier, 77
 - model, 55, 56
 - See also* Marine organisms tracking

YOLOv2 algorithm

- competitive advantage, 80–81
- Darknet19, 80
- K-means clustering, 81–82
- multi-scale detection training, 83
- pre-training model, 82
- VGG16 network, 80

Z

- Zero-mean Gaussian distribution, 193
- Zero-padding augmentation, 194
- Ziegler–Nichols (Z-N) method, 1, 6, 7