

Index

A

- Accessible authentication (AA), 17
- AdaBoost (AB), 150
- Adaptive Multiple Rendezvous Control Channel (AMRCC), 180
- Agent-based modeling
 - act of transportation, 57
 - modeling spatial cognition, 57
 - route choice, 59
 - spatial knowledge, 58
 - spatial learning, 57
 - urban frameworks, 57
- Agent-oriented approach, 53, 54
- Air Quality Index (AQI), 51–52
- Amazon Mechanical Turk, 10
- ANN
 - feed-forward, 97
 - handling units, 96
 - issues, 97
 - learning, 97
 - period arrangement, 97
 - relapse, 97
 - structure, 97
 - suspensions, 97
- Anomaly detection, 199
- Apache Spark, 197
- Arterial Streets Towards Sustainability (ARTISTS), 108
- Artificial intelligence
 - frameworks/models, 91
 - logical fields, 91
 - machine learning algorithm (*see* Machine learning algorithm)
 - scope, 92

- software engineering, 91
- SVM, 92
- urban computing (*see* Urban computing)
- Artificial neural networks (ANN), 22, 53
- Authorized band task, 122
- Auto-Regressive Integrated Moving Average (ARIMA), 170

B

- Bayesian model, 188
- Big Data, 82
- Biomedical informatics
 - CT imaging, 72
 - data and computer, 74, 75
 - description, 69
 - e-wellbeing, 70
 - fields, 69
 - health database
 - indexing, 76
 - MeSH, 76
 - records, 75
 - sites and servers, 75
 - infrared imaging, 73, 74
 - “laboratory record”, 70
 - medical imaging, 71
 - medicinal services, 69
 - MRI technique, 73
 - recursive imaging
 - algorithm, 83, 84
 - data collection, 82, 83
 - management, 82
 - ultrasonic imaging, 72, 73

- Biomedical informatics (*cont.*)
- urban
 - multimedia computing model, 76, 77
 - UCM, 78
 - X-ray imaging, 71
 - Blackberry Limited, 3
 - Board Radio Asset, 116
 - Bolster Vector Machines and Neural Systems, 106
 - Building Data Displaying (BIM), 78
 - Building energy management (BEMS), 217
 - Business Objects, 27
- C**
- Call Detail Record (CDR), 12
 - Call detail records dataset (CDR), 143
 - Case-Based Framework (CBR), 94
 - Challenges with Urban Big Data, 187
 - Chromosome, 120, 121
 - Cloud-based analysis, 222
 - Cloud computing, 21, 22
 - Cognitive administration system, 187
 - Cognitive cycle, 170
 - Cognitive Internet of Things (CIoT), 187
 - Cognitive radio (CR), 115
 - architecture aspect, 165
 - basic channels, 180
 - energy productivity, 180
 - frequency band and transmission parameters, 163
 - general models, 162
 - global wireless infrastructures, 172
 - goals of, 163–165
 - house model, 162
 - level evaluations, 136, 137
 - motor, 170
 - network architectures
 - ANN-centered smart development, 119, 120
 - dynamic spectrum challenges, 118
 - heterogeneity, 123
 - network constituents, 121
 - rule-based algorithms, 118
 - smart computing, 120, 121
 - spectrum heterogeneity, 122
 - spectrum organization outline, 123, 124
 - numerous remote advancements, 161
 - obstruction evasion, 179
 - PHY and MAC segments, 163
 - proactive spectrum determination, 179
 - radio sign and frequency band, 180
 - radio spectrum, 161, 162
 - recommendations, 171
 - resource adaptation, 177, 178
 - satellite communications, 172
 - satellite-earthbound frameworks, 172
 - seamless spectrum handovers, 178
 - selective utilize model, 162
 - self-concurrence, 166
 - sort of activity, 163
 - spectrum handover movement, 178
 - spectrum versatility and handover, 163
 - technology
 - cognitive capacity, 117
 - configurability, 117
 - RF equipment innovations, 118
 - spectrum, 117
 - spectrum hole, 117
 - transceiver planning, 117
 - transmitter parameters, 117
 - UHF and VHF television frequencies segments, 161
 - urban communities, 162
 - validation, CR conventions, 181
 - Cognitive radio benchmarks, 116
 - Cognitive urban handovers
 - classification and features, service, 177
 - cognition-centered spectrum handovers, 175
 - frequency spectrums, 173
 - make-move and precarious, 175
 - market economy, 174
 - mechanical issue, 174
 - radio framework, 173
 - radio spectrum, 173
 - reconfiguration innovation, 174
 - remote correspondence framework, 175
 - spectrum assets, 173, 174, 176
 - spectrum handover, 174
 - spectrum sharing, 173
 - static spectrum, 173
 - system execution, 173
 - transformation, 174
 - utilization of, 174
 - Collaborative ranking models (CR), 143
 - Combination focus (FC), 134
 - Community learning method, 149
 - Commuting data, 51
 - Composite virtual objects (CVOs), 187
 - Computer based intelligence, 91
 - Computing infrastructure, 191
 - Cooperative content distribution (CCD) structure, 220
 - Crime hotspot, 43
 - Criminal analysis techniques
 - block image, 42
 - computational process city-based, 44

- environmental data, 44, 45
 - Kernel density estimation techniques, 45
 - prediction rate dependent, 44
 - social media, 45
 - urban crime, 45
 - managing, 41
 - spatial data analysis, 43
 - spatial-temporal data analysis, 43, 44
 - temporal data analysis, 42
 - Crowdsourcing system (CSS), 10
 - CT imaging, 72
 - Cyber space, 1
 - Cyclical prefix, 129
- D**
- Data analytics, 193, 194
 - Data integration, 192
 - Data mining
 - accessibility of, 41
 - customary urban research, 41
 - ecological criminology, 41
 - monitoring urban land changes, 35, 36
 - need for, 33
 - polysemy issue, 33
 - remotely detected information, 37, 38
 - tasks of, 33
 - techniques, 34
 - web's link structures analysis, 34
 - Data variety, 192, 193
 - Data visualization, 194
 - Database layer, 28
 - Deep learning, 201
 - Demand response (DR), 217
 - Demand side management (DSM), 217
 - Devoted short communication range (DSRC), 13
 - Distance-based methods, 52
 - Dynamic spectrum access (DSA), 116, 173, 179
- E**
- Ecological systems, 118
 - Economy, 52
 - E-health
 - advantages, 85
 - capacity, 84
 - difficulty, 85
 - e-wellbeing application, 86
 - PHC MIS
 - application, 86
 - CSR activity, 86
 - modules, 86
 - Primary Health Center Management Information System, 86
 - wireless network, 85
 - e-health app, 86, 87
 - Electric field, 212
 - Electric monitor, 1
 - Electric signals, 211
 - Electronic clinical record, 70
 - Electronic Healthcare Related Records (E.H.R.), 84
 - Electronic Specialist Solution (E-Remedy), 84
 - Electronic Wellbeing Records, 84
 - Electronically maintained records (EMR), 79
 - Energy, 52
 - Energy efficient network selection
 - cell arrange design, 116
 - cell-phone functionalities, 115
 - cognitive radio benchmarks, 116
 - core femtocells and network, 134–136
 - cost-role-based autonomous handover service, 133
 - femtocells/IEEE 802.11 systems, 116
 - geo-locations database, 115
 - heterogeneous and cognitive systems, 116
 - layers, 137
 - spectrum detecting vs. geo location databases, 134
 - vitality efficiency, 116
 - vitality utilization, 115
 - Energy management systems (EMS), 217
 - Environmental monitoring data, 51, 52
 - European Commission 2009, 215
 - e-Wellbeing, 70
 - Expert frameworks shells, 93
- F**
- Federal Communication Community (FCC), 161
 - Federal Communications Commission (FCC), 13, 126
 - “Femto-gridding” technique, 136
 - Filter bank-based multicarrier transmission (FBMC), 129
 - Fortification learning (RL), 103
 - 4G networking systems, 12
 - Friend of a friend (FOAF), 30
 - Fuzzy set, *see* Fuzzy model
- G**
- Geographic information systems (GIS), 32
 - Geographical data examination plans, 43
 - Geographical-centered services, 7

Geological Region Systems (GAN), 78
 Global Positioning System (GPS), 3, 157
 Global wireless infrastructures, 172
 Green cloud computing (GCC), 208
 Green cloud monitoring system, 221
 Green data center (GDC), 208
 Green Internet of Things (G-IoT), 209
 Green machine-to-machine (GM2M), 208
 Green wireless sensor networks (GWSN), 208
 Guideline based frameworks (RBS), 96

H

Hadoop Distributed File System (HDFS), 197
 Handover activator, 133
 Heating, ventilation, and cooling (HVAC), 220
 Heterogeneity, 123
 Hidden Markov Model (HMM), 188
 Home power management (HEM), 217
 Human centered model, 77
 Human-machine interface (HMI), 50
 agent-oriented approach, 53, 54
 elements, 55, 56
 multi-agent approach, 54, 55
 process supervision, 56, 57
 Human mobility models, 11–12
 Hybrid method, 104

I

Industrial–scientific–medical (ISM), 161
 Information and communication technologies
 (ICT), 145, 152, 185, 207, 209
 Intelligence transportation system (ITS), 21
 Intelligent manufacturing, 216
 Interference, 127
 Interference evasion, 123
 Interference temperature estimation, 126
 International Energy Agency, 216
 Internet, 3
 Internet of Things (IoT), 9, 13, 207, 209
 Intrusion temperature organization, 126

J

Java, 32
 JavaScript, 32

K

K-means clustering, 198
 K-Nearest neighbor (k-NN), 198
 Knowledge engineering, 91, 107

L

Layer of data sources, 153
 Layer platform, 153
 Learning, 120, 188
 Leased spectrum asset, 176
 Light and thermal sources, 213
 Linear regression, 198
 Link layer delay, 127
 Logistic regression (LR), 149
 Long haul observing (LTM), 103

M

Machine learning (ML), 40
 artificial intelligence (AI), 195
 big data frameworks, 197
 big data processing, 196
 channels of information, 196
 smart agents, 195
 smart generation, 197
 trade-off and selection, 198, 199
 urban computing infrastructure, 196
 Machine learning (ML) algorithm
 AB, 150
 AI suites, 106
 association rule extraction, 150
 Bayesian hypothesis, 106
 Bayesian System, 106
 data
 content order, 108
 Principle Lanes, 108
 size groups, 109
 tuples, 108
 decision tree, 106
 detachment limit, 110
 display, 107
 dynamic learning, 110
 GIS, 107
 Guileless Bayes classifier, 109
 Gullible Bayes, 106
 LR, 149
 main streets
 ARTISTS, 108
 rejuvenation, 107
 two-dimensional order table, 108
 mapping keys, 107
 Naïve Bayes Tree, 106
 performance metrics, 150
 result
 design typology issue, 110
 distinct measures, 111
 dynamic learning, 110
 Euclidean separation, 110

- Primary Roads creators, 111
 - urban arranging network, 110
 - RF, 149
 - strategy, 105
 - time and cash, 107
 - urban morphology, 107
 - Machine learning techniques, 92
 - Management planning, 3
 - MapReduce programming, 189
 - Massachusetts Bay Transportation Authority, 200
 - Matched channel recognition, 125
 - Medical care system (MCS), 78
 - Medical imaging, 71
 - Medical subject headings (MeSH), 76
 - Medium access control (MAC) convention, 123
 - Microcomputer processes, 211
 - Mobile and pervasive computing
 - architectural environments, 1
 - cloud computing, 21, 22
 - crowdsourcing systems and services, 10, 11
 - cyber space, 1, 2
 - data mining and analytics, 14
 - design and utility, 2
 - digital devices, 1
 - digital parameter, 2
 - electric monitor, 1
 - human mobility models, smart cities, 11, 12
 - mobile crowdsourcing technology, 8–10
 - mobile network management and systems, 23
 - multi-sourced heterogeneous data acquisition and fusion, 15
 - network architectures, 20
 - network communications technology, 13, 14
 - network mobility and architectures, 22, 23
 - network mobility management, 12
 - planning, urban development, 3, 4
 - security and trust, 16–20
 - smart cities, 8–10
 - smart mobility management, 20
 - system models, 4
 - personalization, 4, 5
 - public and private frameworks, 4
 - smart homes, 4
 - smart technologies, 4
 - vital coordination, 5
 - urban area, 2, 3
 - urban development
 - geographical-centered services, 7, 8
 - intelligent and smart building, 8
 - intelligent building and teleport, 8
 - mode of planning, 6
 - services and society, 6
 - smart transport systems, 8
 - U-business services, 7
 - U-city services, 6
 - U-government, 7
 - U-life, 7
 - virtual and combined environments, 1
 - VR, 1
 - VSN, 13
 - Mobile crowdsourcing technology, 8–10
 - Mobile phone signals, 51
 - Mobile terminals (MTs), 220
 - Mobility network (MN), 20
 - Mobility technology, 2, 3
 - Modeling spatial cognition, 57
 - Multi-agent approach, 54, 55
 - Multi-client systems, 126
 - Multi-specialist framework (MAS), 101
- N**
- Naive Bayesian classifier, 198–199
 - National Library of Prescription (NLM), 76
 - National Radio Astronomy Observatory, 162
 - Near infrared (NIR) imaging, 73, 74
 - Network architectures, 20
 - Network communications technology, 13, 14
 - Network constituents, 121
 - Network mobility management, 12
 - Neural networks (NN), 199
 - Noise-ratio (NR) corruption, 129
- O**
- Out-of-band (OOB) emanation, 129
- P**
- Parallel particle swarm optimization (PPSO)
 - algorithm, 81
 - cloud frameworks, 79
 - EMR, 79
 - network to network and heterogeneous network, 79
 - parameters, 79
 - segments, 79
 - Particle swarm optimization (PSO)
 - algorithms, 80
 - parameters, 79
 - Path-loss, 127
 - PHY-level exploration
 - average energy ratio, 128
 - capabilities, 130

- PHY-level exploration (*cont.*)
 conventions and system engineering, 128
 CR resource organization, 131
 cyclical prefix, 129
 energetic spectrum approachability, 131
 out-of-band (OOB) emanation, 129
 planning, 130, 131
 preliminary signal and preparation
 categorizations, 129
 remote framework, 128
 spectrum detecting, 130
 Point-and-select approach, 75
 “Powerless man-made intelligence”, 91
 Presentation layer, 28
 Primary Health Center Management
 Information System, 85, 86
 Principal receiver recognition, 126
 Proxy routing (PR), 20
 Python, 32
- Q**
 Quality of service (QoS), 123, 128
- R**
 Radar, 62
 Radio frequency (RF), 117, 131
 Radio technologies, 11
 Random forest (RF), 149
 Rapid Deployment for Intelligent Cities and
 Living (RADICAL)
 application, 153
 architecture, 153
 smart cities, 152
 Reinforcement learning, 198
 Reinforcement learning methods, 194
 Remote sensor system (R.S.N.), 85
 Resource description framework (RDF), 30
 Returned and services league (RSL), 156, 157
 RF energy, 212
 Robotic process automation (RPA), 216
 Route choice, 59
 Routing solicitor (RS), 20
 R Tool, 33
- S**
 Satellite communications, 172
 Satellite-earthbound frameworks, 172
 Satellite imagery, 120
 Scan Line Corrector (SLC), 36
 Seamless correspondence, 123
 Self-association method, 164
 Self-enhancement method, 164
 Semantic layer, 28
 Semantically interlinked online networks
 (SIOC), 30
 Semi-supervised algorithms, 193
 Sensed spectrum asset, 176
 Sensor networking
 communication range, 211
 energy consumption, IoT devices, 210
 global warming and environmental
 degradation, 210
 power consumption and battery life, 211
 propagation losses, 211
 signal interaction and space constraints, 210
 smart sensors, 210, 211
 urban environment, 210
 urban habitats, 210
 Smart agriculture, 217
 Smart cities, 206, 207
 advancements, 190–191
 applications, 188
 crowdsourcing systems and services, 10
 human mobility models, 11–12
 mobile crowdsourcing technology, 8–10
 multi-sourced heterogeneous data
 acquisition and fusion, 15
 network communications technology, 13, 14
 VSN, 13
 Smart City Mission, 189
 Smart computing, 120, 121
 Smart generation
 analysis of significant study, 200
 big data analytics, 186
 capabilities of, 186
 cognitive intelligence, 194, 195
 data centers, 186
 density of urban population, 185
 human activity, 185
 information-driven urban planning, 186
 information examination, 185
 literature review, 187, 188
 machine learning, 187
 public safety, 201
 self-sustainable, 185
 sensor based systems, 186
 sensors and smart assets, 186
 smart city, 194, 195
 smart city ecosystems, 186
 smart environment, 201
 smart traffic, 199, 200
 smarter, 185
 tools and applications, 186

- urban function management, 186
- water and power, 201
- Smart healthcare, 216, 217
- Smart home, 215
- Smart industry, 216
- Smart Internet
 - Amsterdam smart city, 156
 - communication paradigm, 141
 - cooperative and competitive situations, 142
 - human and economic activity, 142
 - literature survey, 143, 144
 - local circles, 155
 - RSL, 156, 157
 - self-centeredness, 142
 - smart cities and rapid deployment, 152
 - smart city, 141
 - social informational urbanism, 152
 - social intelligence and machine learning, 148, 149
 - social interdependence, 142
 - social media, 141
 - social networks, 141
 - social support, intervention and technology, 144, 145
 - urban areas, 142
 - urban operations and services, 141
- Smart mobility management, 20
- Smart people, 145
- Smart public safety, 218
- Smart sensors
 - 5G technology, 209
 - green cloud monitoring system, 221
 - green computing, 208
 - green networking and communications, 220
 - green revolution, 212, 213
 - green smart farming IoT, 221
 - green technology, 213
 - healthcare, 205
 - integration of sensor systems, 209
 - IT industry, 208
 - micro-atmosphere observation, 219
 - Microsoft green smart public safety systems, 222
 - organizations, 205
 - renewable energy, 208
 - smart agriculture, 217
 - smart cities, 205
 - smart green transport, Finland, 222
 - smart healthcare, 216, 217
 - smart home, 215
 - smart industry, 216
 - smart public safety, 218
 - smart transportation, 218, 219
 - smart urban regions, 205
 - transport management system, 205
 - urban environment, 208
 - urban green computing environment, 214
 - urban grounds environment, 219
 - urban networks, 205
 - urban zones, 205
 - wireless networks, 209
 - WSNs, ICT and green computing, 206
- Smart transport systems, 8
- Smart transportation, 218, 219
- Smart urban communities, 188
- Social advancement, 206
- Social CR model (SCR), 143
- Social network (SN) assessment models, 143
- Social network data (SND), 52
- Social network services (SNS), 144
- Social networks (SN)
 - analysis, 146, 147
 - complex smart city ecosystem, 145
 - location, 151, 152
 - service groups, 145
 - smart city ecosystem, 146
 - sport, 157
- Social ranking
 - betweenness centrality, 147
 - closeness centrality, 147
 - degree centrality, 147
 - Eigen-vector centrality, 148
 - link analysis, 148
 - local clustering coefficient, 147
 - page rank algorithm, 148
- Social relationships, 144, 146
- Software-defined radio (SDR), 115
- Spatial data, 193
- Spatial data analysis, 43
- Spatial factor examination, 43
- Spatial-fleeting relationships, 44
- Spatial knowledge, 58
- Spatial-temporal data analysis, 43, 44
- Spatial visualization layouts, 194
- Spectrum assignment, 165
- Spectrum decisions, 124
 - CR systems, 127
 - frequency features, CRNs, 127, 128
 - spectrum choice, 127
- Spectrum detecting, 124
 - contests, 126
 - CR systems, 124
 - intrusion temperature organization, 126
 - principal receiver recognition, 126
 - principal transmitter recognition, 125

Spectrum distribution, 124
 Spectrum heterogeneity, 122
 Spectrum mobility, 131, 132
 Spectrum movement, 124
 Spectrum movement issues, 132, 133
 Spectrum organization outline, 123, 124
 Spectrum sensing, 115
 Storage infrastructure, 192
 Supervised algorithms, 193
 Supervised learning, 198
 Support vector machine (SVM), 92, 109, 199
 Swarm intelligence

- knowledge strategy, 79
- PPSO (*see* Parallel particle swarm optimization (PPSO))
- PSO (*see* Particle swarm optimization (PSO))

 Swarm knowledge (SI), 102
 Synthetic aperture radar (SAR), 62

- box-molded structures, 64
- interferometric, 63, 64
- processing, 62, 63
- reflectance and geometric data, 64

T

Temporal data analysis, 42
 Texas Transportation Institute, 200
 Transfer learning algorithm, 53
 Transmissions, 166
 Transportation Department, 200
 Transportation systems, 7
 Trust state machine (TSM), 17
 Trusted state (TS), 16
 Trusted values (TV), 16, 17

U

Ultrasonic imaging, 72, 73
 Ultra-wide band (UWB) systems, 165
 Unauthorized band activity, 123
 United Nations Population Fund, 185
 Universal serial bus (USB), 181
 Universal software radio peripheral (USRP), 181
 Unlicensed National-Information Infrastructure groupings, 161
 Unsupervised learning, 198
 Urban big data

- city frameworks, 189
- computing infrastructure, 191
- data analytics, 193, 194
- data integration, 192
- data variety, 192, 193

data visualization, 194
 environment, 189, 190
 science and informatics, 189
 security, 194
 solid recursive connection, 189
 storage infrastructure, 192
 urban computing environment, 190
 Urban computing, 142, 158

- computer program, 93
- control component, 93
- control instrument, 92
- control system, 93
- expert frameworks shells, 93
- fuzzy systems, 100, 101
- genetic algorithms
 - characteristic determination, 98
 - chromosome, 98, 100
 - determination, 99
 - end condition, 100
 - hybrid, 98
 - instatement, 99
 - k* qualities, 99
 - spatial distribution, 100
 - transformation, 100
- heuristic strategy, 92
- hybrid method, 104
- investigation, 92
- machine learning algorithm, 105, 106 (*see also* Machine learning algorithm)
- multi-agent system concept, 101, 102
- RL, 103, 104
- swarm intelligence, 102, 103

 Urban construction

- CBR procedure, 94–96
- CBS, 94
- information and rules, 94
- KBS, 94

 Urban development, *see* ANN
 Urban mobile networks

- cross segment configuration, 167
- learning-dependent, 167
- methodologies and application, 167
- predictable significance, 167
- primary qualities, 167
- quality of services, 166

 Urban planning, 31–33, 96, 121, 188
 Urbanization

- commuting data, 51
- damage detection, 62
- distance-based methods, 52
- economy, 52
- energy, 52
- environmental monitoring data, 51, 52

- interferometric SAR, 63
- mobile phone signals, 51
- modern applications, 50
- multimodal frameworks, 49
- multimodality, 49
- SAR Processing, 62
- signal processing, 49, 50, 62
- simulation setup and results, 64
- simulation setups, 59, 60, 62
- SND, 52
- transfer learning algorithm, 53
- urban (*see* Urban)
- urban structure, applications, 50
- Use of Sensor Technology, 207
- User traffic-model
 - assessment, 168
 - channel for transmission, 169
 - developmental methods, 169
 - models, 169
 - primary client, 168
 - remote situations, 169
 - social occasion, 169
 - spectrum forecast, 169
 - time arrangement, 170
- Utility computing model (UCM), 78
- Utility Figuring, 78

V

- Vehicular cloud computing (VCC), 21, 22
- Vehicular social networks (VSN), 13
- Vibrations and movement, 212
- Video calling conference, 3
- Virtual market, 7
- Virtual objects (VO), 187
- Virtual reality (VR), 1
- Vitality efficiency, 115
- Vitality identification, 125

W

- Web Applications, 30, 31
- “Web 2.0” applications, 28
- Web-based framework, 31–33
- Web design engineering, 30, 31
- Web intelligence (WI)
 - architecture
 - agents, 30
 - empowers capacity, 30
 - establishment, 29
 - interpersonal organizations, 30
 - models, 29
 - three-level engineering, 28
 - three-tier architecture, 29
 - urban planning, 31–33
 - web-based framework, 31–33
 - web design engineering, 30, 31
 - basic leadership support, 27
 - contextual analysis, 28
 - data warehouse, 27
 - development of, 28
 - framework propels, 28
 - instruments, 28
 - town and peri-town grounds, 38, 39
 - urban land information, 39, 40
 - worldwide commercial center, 27
- Web ontology language (OWL), 30
- Wind energy, 212
- Wireless access within the vehicular environment (WAVE), 13
- Wireless communication system, 207
- Wireless connection mistakes, 127
- Wireless sensor networks (WSN), 208, 211
- World Business Council for Sustainable Development (WBSCD 2008), 215

X

- X-ray Imaging, 71