## Index

### A
- adaptive courseware environment (ACE) 101, 111
- adaptive hypermedia architecture (AHA!) 80, 101, 109
- agent-based recommender system 60
- agent-based workflow execution 176, 178, 188-189, 199
- agent-centric workflow execution 176, 178
- Agent code 32, 35-36, 38-39, 56-57, 95, 142, 177, 216-217
- Agent Core (AC) 111, 187, 239
- Agent data 32, 70, 95
- Agent Delegation Model (ADM) 178, 184, 190, 197-198
- Agent Execution Environment (AEE) 48-49, 116
- Agent execution thread 32
- Agent for Remote Action (ARA) 40-42, 57
- Agent Interaction Protocol (AIP) 92
- Agent Mobility 42, 50, 86, 93, 108, 111-112, 189
- Agent Tel 37, 39-40, 57
- Agent Workflow Definition (AWD) 197-198, 205
- Aglets 37, 39, 52, 57, 92-93, 114, 116, 119, 132-133, 140, 143, 145, 153-154, 156, 165, 225, 228
- Aglet Software Development Kit (ASDK) 154, 165
- AICC (Aviation Industry CBT Computer-Based Training) 149
- American Society for Training and Development (ASTD) 162
- Analytic Hierarchy Process (AHP) 10
- applet 154
- Applet-Servlet 153, 156-158
- ARIANDE (Alliance of Remote Instructional Authoring and Distribution Networks for Europe) 150
- Artificial Intelligence (AI) 32, 79-81, 86, 88, 108-111, 149, 164, 166, 260, 277, 292
- Asymptotic Dispersion Rate (ADR) 256

### B
- Bandwidth Measure Server Agent (BWMSA) 118, 120-121, 124-126
- Belief- Desire-Intention (BDI) 56
- Bit Error Rate (BER) 7-9
- bitstream 233-238, 240, 242, 245, 256, 266
- Broadcast and Multicast Services (BCMCS) 4
- BWMeasure Client Agent (BWMCA) 120-121, 124-126

### C
- C++ 36, 38, 42, 58, 127, 161
- Capability Finding Agent (CFA) 118-121, 123-127
- Case-Based Reasoning (CBR) 73-74, 148-149, 158-161, 164-166
- CbNaVt framework 253-254, 256, 263-264, 266-267, 269
- cellular networks 2-3, 28, 48, 57
- Centralized Recommender Systems (CRSs) 64-65
- CEZW algorithm 258-259
- CEZW coder 258, 260
- Client-Server paradigm 32-33, 93, 174, 246
- CoD (Code On Demand) 94, 157, 186
- collaborative agents 86-87
- Collaborative Filtering (CF) 61-63, 65-67, 70-73, 75-76, 78-82, 84
- Color Embedded Zerotree Wavelet (CEZW) 256, 258-260, 266
- Communication encryption 234
- Composition Engine (CE) 173-176, 178-179, 185, 192, 197-198, 205-206
- Composition Language (CL) 72-73, 173, 225
- Computational Language for Autonomous, Intelligent, and Mobile Agents (CLAIM) 91, 111
- Concordia 42-43
- Conduit Server 42-43
Content-based Network-adaptive Video-transmission (CbNaVt) 251-254, 256, 263-264, 266-267, 269
Content-Boosted Collaborative Filtering (CBCF) 66, 81

D
D’Agent 39
DartFlow 184, 188, 212
Data Access Manager Agent (DAMA) 118-121, 124, 126-127
Defense Advanced Research Projection Agency (DARPA) 165-166, 265
Denial of Service (DoS) 46, 51, 224
Department of Defense (DoD) 121-122, 149
deployment groups (DGs) 274, 277-280, 282-288, 290-292, 294
DIDO mobile agent 142-143, 145
Digital Video Broadcasting (DVB) 5, 26
Discrete Cosine Transform (DCT) 234-235, 237, 239, 256
Discrete Wavelet Transform (DWT) 235, 242-243, 252, 256, 266
distributed hash table (DHT) 181
Distributed Location and Routing Service (DLRS) 192, 195-197, 199, 202-203
distributed multimedia services 252
Distributed Sensor Network (DSN) 274, 276-278, 287, 292-294
Distributed Video Communication (DVC) 252, 263
Distributed Video Surveillance (DVS) 232, 251-254, 263-264, 266, 268-269
DSP (Digital Signal Processing) 234, 266
dynamic binding 177, 183-184, 188-189, 193-194, 197
Dynamic Itinerary and Dynamic Order (DIDO) 138, 141-143, 145, 216
Dynamic Resource Allocation (DRA) 256-257, 259-260, 262-263

E
e-Learning 84, 111, 148-153, 157-158, 161-166, 171
embedded systems 232, 249
embedded zero-tree coding of wavelet coefficients (EZW) 242
Enhanced Data Rates for the Global System for Mobile Communications (GSM) Evolution (EDGE) 3

Entrophy Coding 240
e-execution coordination technique 179
Extended Service Set (ESS) 4, 10

F
Fault Tolerance 34, 36, 93, 189, 194, 211, 217-218, 228-229
Foundation for Intelligent Physical Agents (FIPA) 91
fuzzy indicator matrix 85, 105
Fuzzy Logic 9-10, 112
Fuzzy Membership Functions 112

G
GESTALT (Getting Educational Systems Talking Across Leading-edge Technology) 150
global shared memory-based coordination 180
Global System for Mobile Communications (GSM) 3, 8-9, 171, 233, 264
Grey Relation Analysis (GRA) 10
group association 274, 276-277, 279-283, 285-289, 291-292
Group of Pictures (GOP) 237, 258-260
GUI (Graphical User Interface) 152

H
Handover decision 6-10, 16, 27, 30
Handover execution 7, 10
Handover initiation 6, 8, 15, 25
handover management 1-2, 4, 6-7, 13, 15-16, 20, 22, 24-25, 28, 30
heterogeneity 2, 5, 149, 168-170, 198, 274, 277
Heterogeneous Distributed Sensor Network (HDSN) 274, 276-280, 282-283, 285, 287, 290-292, 294
Hierarchical Mobile IPv6 (HMIPv6) 12, 29
Host Identity Protocol (HIP) 13, 28
HTTP (HyperText Transfer Protocol) 26, 28-29, 46, 56-58, 79-83, 109, 111, 132-133, 145-147, 156,
158, 163-165, 210-214, 228, 230, 272
Hybrid Agent 85-86, 88, 100, 108, 112

I
IBM Aglet server 140, 143
indirection agent approach 11
Information agents 62, 81, 88, 146, 228
Integrated Development Environments (IDEs) 92
intelligent coding framework 254
Inter Access Point Protocol (IAPP) 11
Index

Interface agents  85-88, 90, 98-100, 102, 106, 108, 112, 159
Internet Key Exchange version 2 (IKEv2)  15, 26-27
Internet Protocol (IP)  2-6, 10-16, 26-29, 39, 45, 58, 126, 252, 272
Intrusion Detection System (IDS)  225, 277, 280, 282, 285-292
IP-based surveillance solutions  254
IP Multimedia Subsystem (IMS)  3, 26

J
JACK Agent Language (JAL)  92
Java Aglets  39
Java Applets  94, 116
Java Object Serialization (JOS)  43, 57
Java Virtual Machine (JVM)  37, 40, 42, 46-48, 51, 156, 165
JBoss Application Server (JBossAS)  198, 212
Job Performing Agent (JPA)  118, 120-121, 123, 126-127
Joint Video Compression and Encryption (JVCE)  232, 240, 243, 245, 247-248
JVCE algorithms  232, 243, 247

K
Knowbot  38
Knowledge and Behavior Update Language (KA-BUL)  92
Knowledge Interchange Format (KIF)  90
Knowledge Query and Manipulation Language (KQML)  90-91

L
Learning Object Metadata (LOM)  102, 149-150
Learning Object Repository (LOR)  102, 111
Load Balancing  9, 34, 168, 193-194
local area networks (LAN)  2, 4, 27, 29, 115, 143, 154-156
Local Location and Routing Service (LLRS)  192, 194-197, 199, 203
location management  5-6, 13-14, 16, 82
LRN (Learning Resource iNterchange)  150
LTSC (Learning Technology Standards Committee)  149-150

M
MA-based WFMSs  167, 177
master-slave agent delegation model (Master-slave ADM)  197-198
Maximal Sequence Path (MSP)  28, 179-180, 184-186, 197
mean absolute error (MAE)  77-78
Media-independent command service (MICS)  8
Media-independent event service (MIES)  8
Message Passing Interface-Agent Based (MPIAB)  116, 133
Mobile Agent based Collaborative Computing (MACC)  115-119, 121, 123, 127-132
mobile agent based discovery  141, 144
mobile agent-based service architecture  47
Mobile Agent Code Environment (MACE)  38-39, 57
Mobile Agent Middleware for Multimedia Services (MMM)  53-54, 58
mobile agent paradigm  31-33
Mobile-C  38, 58
Mobile Code Collaboration Framework (MCCF)  186-188, 212
Mobile Cognitive Agent (MCA)  53
mobile communications  2-3, 66, 232
mobile elements (MEs)  54, 291-293
Mobile IP with location registers (MIP-LR)  12, 27
mobile multimedia encryption  234
Mobile Objects and Agents (MOA)  46-47
Mobile Virtual Terminal (MVT)  26, 48-49
mobility support  4, 6, 12, 14-15, 22, 26-29, 31, 48, 50, 211
MOLE  44, 57, 89
multi-agent platform  38, 58, 90
Multimedia Broadcast/Multicast Service (MBMS)  4, 27
Multimedia Information- Mobile Agent Architecture for Ubiquitous Retrieval and Delivery (MI-MERCURY)  54, 58, 84
Multimedia Mobility Management System (M3S) 16-18, 20, 25
Multimedia Resources (MRs) 60-63, 65, 67-77, 79
Multiple Attribute Decision Making (MADM) 9-10, 30
Multiple Huffman Tables (MHT) 241

N
Nearest Neighbor (NN) 160
Network coverage estimation 7
network latency 35, 52, 98, 132, 155, 215
network load 15, 35, 86, 98, 115, 132, 193, 215
Network-related information 7
Neural Networks 9-10, 30
No Ad Hoc (NOAH) 21
Normalized Distance-based Performance Measure (NDPM) 77

O
Object Management Group (OMG) 52, 91, 213
Object Recognition (OR) 266, 269
Object Request Broker (ORB) 45
Obliq 36-37
one-way accumulator (OWA) 274, 276-277, 281-283, 285, 289
Open Courseware Consortium (OCW) 162

P
P2P network 67
P2P topology 67
pairwise 274, 276, 281, 283-284, 287-290, 292
parent workflow 175-176, 198
peak signal-to-noise ratio (PSNR) 22-24, 260-262
PEr-Oriented Recommender system (PEOR) 67
Peer-to-peer communication 93
Peer-to-peer (P2P) 65, 67, 81-82, 93, 190, 215, 228
Perl 5 38
personalized learning (p-Learning) 85-86, 88, 90, 100-103, 105-107, 112, 149
Personalized Mobile Multimedia (PMM) 53, 57
p-Learning system 86, 90, 100, 102-103, 105-107
Policy Decision Function (PDF) 3, 56-58, 69, 83, 109, 161, 210, 212, 214, 293
Pretty Good Privacy (PGP) 40
probe gap model (PGM) 255
probe rate model (PRM) 255-256
Processing proxy server (PPS) 4, 251, 263
pseudo inverse matrix 274, 281-283
Push!Music 66-67
Python 38, 44

Q
Quality of Multimedia Streaming (QMS) 16-20, 22

R
Radio link quality 7-8
Real Time Protocol (RTP) 3-4, 26
Received Signal Strength (RSS) 7-8, 15, 61-62, 64-66
recommender systems 60-64, 66-67, 78-84
Register Transfer Language (RTL) 38
Remote Method Invocation (RMI) 45, 114, 132-133, 146, 152-157, 229
Remote Procedure Calls (RPC) 39, 45, 132, 136, 145, 152, 156-158

S
SCORM (Sharable Content Object Reference Model) 149
Scrambling 234-236, 243, 245, 249-250
search engines 54, 135-136, 140, 144-145
Secure and Open Mobile Agent (SOMA) 48, 52, 192, 198, 214
Secure Arithmetic Coding (SAC) 242, 249
Secure Real-time Transport Protocol (SRTP) 234, 236, 248
Secure Wavelet Transform (SWT) 242-245, 249
Server Intelligent Agents (SIAs) 48
Service composition 167-168, 172-173, 184, 189-190, 210
service composition platforms 172
Service Creation Unit (SCU) 48
Service Management Unit (SMU) 48
Servlet 153-154
Session Initiation Protocol (SIP) 3, 15-16, 21-24, 29
Session Layer Mobility Management (SLM) 15, 28
signal to noise ratio (SNR) 7
Simple Additive Weighting (SAW) 10
sink rooted tree (SRT) 280, 283-285, 287-288, 290-291
Smooth Adaptive Soft-Handover Algorithm (SA-SHA) 16-26
software information agents 62
static binding 177, 183, 189
Index

static build-time approach 183
Static Cognitive Agent (SCA) 53
Static Itinerary Dynamic Order (SIDO) 138-139, 141
Static Itinerary Static Order (SISO) 138, 141
sub-workflow 175-176, 180, 198
sub-workflow distribution 175-176, 198

T
Task Scheduler Agent (TSA) 118-121, 123-127
Tasks Manager Agent (TMA) 118, 120, 124-125
Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) 10
Telescript 36-37, 93, 146
Terminal-related information 7
Third Generation Partnership Project (3GPP) 3-4, 26-27, 234
Thomas Edison Program for Environmental and e-Learning Development (TPED) 164
Time-Adaptive Mean of Gaussian (TAMOG) 257-259, 262
Tool Agent (TA) 174, 184, 188, 222
Tool Command Language (Tcl) 37, 39-40, 42, 44, 57, 69
Transcoding 54, 168, 234-236, 243, 253
Transmission Control (TC) 14, 57, 252
Transport Layer Seamless Handover (TraSH) 14, 26
TRA VELLER 116
Tromso And Cornell Moving Agents (TACOMA) 43-44, 58

U
Ubiquitous Computing 60-61, 84, 168-169, 293-294
ubiquitous library 54-55
ubiquitous multimedia devices 251
Ultra Mobile Broadband (UMB) 4, 26
Universal Mobile Telecommunications System (UMTS) 3-5
Unmanned Air Vehicles (UAVs) 121
User Intelligent Agents (UIAs) 48, 116
User Interface (UI) 7-8, 41, 66, 86, 88, 98-99, 108, 112, 121, 152, 267
User-Level Workflow (ULW) 185-186
User Virtual Environment (UVE) 48-49

V
VEA algorithm 237
Video coding 4, 237, 239, 243, 251, 253-254, 256, 259, 269, 272-273
Video Encryption Algorithm (VEA) 237-238
Virtual Machine (VM) 37, 40, 42, 45-46, 48, 51, 116, 152, 165
virtual processor interface (VPI) 116
Virtual Resource Manager (VRM) 48
Visual Object (VO) 252, 256, 258-261, 266-269
Visual Surveillance and Monitoring (VSAM) 254, 265, 271

W
Wavelet Transform 234-235, 240, 242-243, 245, 249, 252, 256
Web-based Training (WBT) 148, 150
WFMS platforms 173
wireless data networks 4
Wireless Local Area Networks (WLAN) 2, 4, 8, 15, 26, 28, 48, 57
Wireless Metropolitan Area Networks (WMAN) 2, 4
Wireless Sensor Network (WSN) 132, 275, 277, 293
Wireless Wide Area Networks (WWAN) 2, 4, 26, 58
WorkDomain Manager Node (WMN) 190-191, 193-196, 199-203, 206
Worker Nodes (WNs) 190, 194-195, 200, 202, 205-206
Workflow Executor (WE) 185
Workflow Management Systems (WFMS) 34, 167-168, 173-177, 183-185, 189, 210-211, 213
workflow partitioning 175, 178, 189
Wrapper Agent (WA) 161, 185, 198

X
XML-based proposals 172
XML (eXtensible Markup Language) 54, 69, 83, 111, 187, 213-214

Z
zero-tree-based compression algorithms 242