Index

A
abstract pattern matching 214
abstract policies 147, 149, 150
access control 124, 125, 177, 179, 181
accessibility criterion 205
ad hoc network 1, 2, 5, 64
ad hoc routing 1, 2, 6, 7, 13
ad hoc systems 147
adjustment function 27
aggregating nodes 92
aggregation 127, 128, 129, 130
aggregation operator 92
ambient calculus 136
annotator 33, 34
anomaly detection 90
aperiodic 56
architectural abstractions 122
architectural model 139
architectural styles 125, 126, 127, 133, 134, 135, 137, 138, 139, 140, 141, 142, 143
artistic creation 193
attrition rate 82
auction 130
authentication mechanism 124
autonomous system (AS) 2, 3, 4, 5
availability criterion 205

B
beaconing 8
behavioral simulation 152
bit-flipping 83
bit multiplier 83
black hole 89
blogosphere 55, 58
body sensor node (BSN) 134
bootstrapping 79, 80, 84, 124
border gateway protocol (BGP) 1, 2, 3, 4, 5, 6, 9, 13, 14, 81, 93, 94, 95, 96, 100, 101, 102
bottlenecks 44, 48, 52, 53

C
cardinality 123
categorical 23
causal spread 193, 201
centrality analysis 45, 50
central limit theorem 56
central representative points 44
certification authority (CA) 88, 100, 125
channel ambient calculus 136
chaotic environments 79
classification uncertainty 25
closed deployment 28, 29
closed-loop 199
cluster heads 5
cluster routing 5, 7
coalition environments 15, 28, 34, 38, 64
coalition network 79, 82, 103, 121, 147
coalition operations 121, 146, 191, 193, 194, 223, 224
coalition partners 121
cognitive extension 191, 192, 193, 194, 202, 204, 206, 210, 211, 212, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 232, 233, 234
cognitive processing 192, 193, 195, 201, 202, 203, 211, 212, 213, 215, 216, 217, 218, 219, 220, 222, 223, 224, 231, 233
cognitive sandwich 194
cognitivist theory 196
collaborative decision making 174, 175, 176, 177, 178, 186, 188
combiner 34
commitment information 4
commodity 29
common context of operation (CCO) 28, 29, 38
common means 15, 16
communication links 42
community analysis 45
community detection 45, 49
community management 123
community model 122, 124
compliance checking 151
composition 122, 125, 127, 128, 129, 130, 133, 135, 144
computational pragmatics 256, 257, 266, 267, 270, 271, 272
computation cost multiplier 83
conceptual analysis 177
conceptualization 42
concrete policies 149, 150
conflict check 110
conflict resolution 175, 186
congestion detection 47
connectivity 64, 77, 106, 113, 115
connectivity information 3, 4
cost externalism 193, 195, 232, 233
contract bidding 25
cold control data multiplier 83
cooperative control 129, 130
cooperative routing 81, 83, 98
correlation 132
cost-based specification 9, 10
coupling conditions 206, 211, 220
coverage check 110
coverage gaps 151, 152
cultural analysis 174, 178, 185, 188
cultural model 174, 176, 177, 178, 183, 184, 185, 186, 187, 188
cultural network analysis (CNA) 177, 183, 184, 185
customer relationship management 20

d

daisy-chained 22
data-centric 106
data integration 47, 208
data mining 43
deauth 82
decision making 174, 175, 176, 177, 178, 183, 184, 186, 188
decision mechanisms 3
decision support 174, 177, 178, 189
degree distributions 44, 55
degrees of separation 53
delay-tolerant networking 133
deliberate placement 64
denial of service (DoS) 81, 83, 92, 98
deployment strategies 64
detection uncertainty 25
deterministic placement 64, 74
diffusion 131, 132, 133, 135
dimensionality reduction 48
directed graphs 53
discovery service 122
dissemination 16, 17, 54, 103, 118
distributed computing systems 180
distributed management task force (DMTF) 104, 120
domain autonomy 6, 7
domain language 154
domain name service (DNS) 87
dominance check 110
dynamic behavior 45
dynamic coalition environments 15, 28
dynamic communities 103
dynamic process 166

e
edge streams 49, 54
effort ratio 82
empirical spectrum distribution (ESD) 57
encapsulation 126, 127, 128, 130, 134, 135
end-receivers 22
dend-sources 22
dend-to-end systems 16, 38
dend-user goals 148, 149, 150
<table>
<thead>
<tr>
<th>Term</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>enterprise privacy authorization language (EPAL)</td>
<td>181</td>
</tr>
<tr>
<td>enumerative specification</td>
<td>10</td>
</tr>
<tr>
<td>epidemiology</td>
<td>238, 250, 255</td>
</tr>
<tr>
<td>epistemic actions</td>
<td>200, 201</td>
</tr>
<tr>
<td>error-tolerant matching</td>
<td>50</td>
</tr>
<tr>
<td>estimation uncertainty</td>
<td>25</td>
</tr>
<tr>
<td>event calculus (EC)</td>
<td>153, 154, 156, 157</td>
</tr>
<tr>
<td>executable policies</td>
<td>147, 149, 151</td>
</tr>
<tr>
<td>extended access control markup language (XACML)</td>
<td>181</td>
</tr>
<tr>
<td>extended cognition</td>
<td>191, 193, 201, 202, 211, 212, 213</td>
</tr>
<tr>
<td>extended cognitive system</td>
<td>191, 193, 200, 201, 202, 203, 204, 206, 207, 211, 212, 216, 217, 219, 220, 222, 224, 235</td>
</tr>
<tr>
<td>extended mind</td>
<td>191, 192, 193, 195, 203, 204, 205, 206, 207, 209, 210, 211, 218, 224, 226, 227, 231, 232, 233, 234, 235, 236</td>
</tr>
<tr>
<td>extended phenotype</td>
<td>198</td>
</tr>
<tr>
<td>externalism</td>
<td>191, 193, 195, 196, 199, 204, 232, 233</td>
</tr>
<tr>
<td>eyewear systems</td>
<td>207</td>
</tr>
<tr>
<td>F</td>
<td></td>
</tr>
<tr>
<td>falsification</td>
<td>93</td>
</tr>
<tr>
<td>federated database</td>
<td>105, 113, 114, 115, 118, 119</td>
</tr>
<tr>
<td>feedback control system</td>
<td>199</td>
</tr>
<tr>
<td>fingerprinting</td>
<td>79, 88, 98</td>
</tr>
<tr>
<td>fitness-of-use</td>
<td>22, 24, 37</td>
</tr>
<tr>
<td>flooding</td>
<td>90</td>
</tr>
<tr>
<td>follower jammer</td>
<td>85, 87</td>
</tr>
<tr>
<td>forbidden-set specification</td>
<td>10</td>
</tr>
<tr>
<td>forwarding path</td>
<td>3</td>
</tr>
<tr>
<td>frequency hopping</td>
<td>84, 85, 86, 87, 98, 101, 102</td>
</tr>
<tr>
<td>frequent pattern mining</td>
<td>45, 51, 52, 53, 57</td>
</tr>
<tr>
<td>frequent patterns</td>
<td>52, 53</td>
</tr>
<tr>
<td>freshness uncertainty</td>
<td>25</td>
</tr>
<tr>
<td>full graph classification</td>
<td>45, 46</td>
</tr>
<tr>
<td>functionalism</td>
<td>195</td>
</tr>
<tr>
<td>fusion</td>
<td>128, 129</td>
</tr>
<tr>
<td>G</td>
<td></td>
</tr>
<tr>
<td>GaianDB</td>
<td>105, 113, 114, 118</td>
</tr>
<tr>
<td>global patterns of interaction</td>
<td>52</td>
</tr>
<tr>
<td>global terrorism</td>
<td>80</td>
</tr>
<tr>
<td>graph algorithms</td>
<td>47</td>
</tr>
<tr>
<td>graph classification</td>
<td>45, 46, 52</td>
</tr>
<tr>
<td>graph clustering</td>
<td>46, 47, 48</td>
</tr>
<tr>
<td>graph clustering algorithms</td>
<td>47</td>
</tr>
<tr>
<td>graph mining</td>
<td>42, 43, 44, 45, 57</td>
</tr>
<tr>
<td>graph partitioning</td>
<td>47, 48</td>
</tr>
<tr>
<td>graph summarization</td>
<td>48</td>
</tr>
<tr>
<td>H</td>
<td></td>
</tr>
<tr>
<td>heterogeneous</td>
<td>1, 2, 3, 5, 6, 12, 13</td>
</tr>
<tr>
<td>hierarchical beaconing</td>
<td>8</td>
</tr>
<tr>
<td>hierarchical control</td>
<td>129, 130, 133, 135</td>
</tr>
<tr>
<td>hill-climbing</td>
<td>48</td>
</tr>
<tr>
<td>historical information</td>
<td>46</td>
</tr>
<tr>
<td>holistic</td>
<td>21</td>
</tr>
<tr>
<td>homogeneous</td>
<td>1, 5</td>
</tr>
<tr>
<td>hop counts</td>
<td>3, 10, 12</td>
</tr>
<tr>
<td>hostile environments</td>
<td>63</td>
</tr>
<tr>
<td>human-computer interaction (HCI)</td>
<td>16, 158, 159, 169</td>
</tr>
<tr>
<td>hybridization</td>
<td>205</td>
</tr>
<tr>
<td>hybrid routing</td>
<td>5, 7, 10</td>
</tr>
<tr>
<td>hybrid routing protocols</td>
<td>5</td>
</tr>
<tr>
<td>I</td>
<td></td>
</tr>
<tr>
<td>identity-based sequential aggregate signatures (IBSAS)</td>
<td>96</td>
</tr>
<tr>
<td>IDRM</td>
<td>7, 9, 11, 13, 80, 100</td>
</tr>
<tr>
<td>individual graphs</td>
<td>52</td>
</tr>
<tr>
<td>influence diagrams</td>
<td>247, 249</td>
</tr>
<tr>
<td>information access</td>
<td>207, 208, 211</td>
</tr>
<tr>
<td>information assets</td>
<td>103</td>
</tr>
<tr>
<td>information elements</td>
<td>43</td>
</tr>
<tr>
<td>information flows</td>
<td>43, 44, 50, 54</td>
</tr>
<tr>
<td>information fusion</td>
<td>23, 24, 32</td>
</tr>
<tr>
<td>information gathering</td>
<td>24, 25</td>
</tr>
<tr>
<td>information hubs</td>
<td>50</td>
</tr>
<tr>
<td>information networking</td>
<td>43, 46, 50, 51, 52, 57</td>
</tr>
<tr>
<td>information networks</td>
<td>16, 42, 43, 44, 46, 47, 48, 50, 52, 53, 57, 58</td>
</tr>
<tr>
<td>information objects</td>
<td>32, 33, 34</td>
</tr>
<tr>
<td>information processing</td>
<td>22, 24, 34</td>
</tr>
<tr>
<td>information processors</td>
<td>15, 16, 18, 32, 38, 39</td>
</tr>
<tr>
<td>information sharing</td>
<td>104, 106</td>
</tr>
<tr>
<td>information stream</td>
<td>21, 22, 33, 34</td>
</tr>
</tbody>
</table>
information value 25
information value theory 25
intelligence, surveillance, and reconnaissance (ISR) 105, 106, 107, 108, 149, 167, 168, 169
interaction model 130, 133
interchange 48
interconnected 1, 2, 121, 131
inter-domain 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13
inter-domain routing 1, 2, 3, 5, 6, 7, 8, 9, 10,
11, 12, 13, 79, 80, 81, 89, 92, 93, 95, 99
inter-domain routing gateways 81
inter-domain routing protocols (IDRP) 89
interior gateway protocol (IGP) 3
internal gateway detection 4
internalist 192, 195, 196, 200
internal network knowledge 4
Internet service providers (ISPs) 3
internetwork 1
interoperability 2, 3, 5, 6, 103, 104, 106, 118,
186
intra-cranial 192, 193
intra-domain 1, 2, 4, 6, 7, 8, 9, 10, 11, 12, 79,
80, 88, 89, 90
intuitive goals 146, 147
isomorphism 50, 51, 52

J

jamming attacks 80, 83, 84, 86, 87, 90, 101,
102
jitter multiplier 83

L

large-scale communities 126
latency 21, 24, 35
latency multiplier 83
lattice 64, 69, 70, 72, 74
layered networks 16
least squares method 50
life-cycle 103
lifecycle management 174
lifetime advantage 82
limiting distribution 56
link analysis 53
link-based failure 48
localization mechanism 25
localization outcome 20
logical relationships 42, 43
long multiplication 193, 200

M

maintenance protocols 83, 98
malicious node 79, 89, 91, 92, 96
managed environment 108, 109, 110, 112, 118
massive structural behavior 44
matrix inversion 88
maximum flow problem 47
medium access control (MAC) 82, 83, 86, 90,
97, 100, 101, 102
membership management 124, 125
mental models 183, 184, 185, 238, 239, 240,
241, 242, 243, 244, 245, 246, 247, 248,
250, 251, 253
metadata 16, 18, 29, 32, 33, 34, 35, 36, 38, 39
meta-information 24
middleware 105, 115, 116, 118
military environments 64
military networks 42, 43
milliamp 162, 163
min-hash approach 48, 49
misbehavior detection 79, 90, 97, 102
misclaiming 93
mixture modeling 185
mobile ad-hoc networks (MANETs) 1, 2, 4, 5,
6, 7, 8, 9, 10, 11, 12, 13, 64, 79, 80, 81,
82, 83, 84, 87, 88, 89, 90, 91, 92, 94, 97,
98, 99, 100, 121
modality conflicts 151, 152, 157, 170
modifier 34
monolithic 28, 80
monolithically 20
morphological 197, 198
multicast 83, 90, 91, 98
multi-exit discriminators (MEDs) 3
multipart coalition 16
multiple activity graphs 52
mutual control 131

N

network analysis 176, 184
network-centric 42, 43
network-centric operations (NCO) 16
network compression 45
network dynamics 1, 2, 9, 12
network management system (NMS) 89
network monitoring 79, 90
network partitioning 8
network topology 1, 4, 6, 7, 11
neurocentric view 192
neuroscience 192, 202, 212, 234
next-hop specification 10
node clustering 47, 48, 49
node clustering algorithms 47, 48
node mobility 5, 6, 7, 11, 12, 13
nodes 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 53, 54, 55, 57, 58
numerical 23, 36, 38

O
object model 112, 114, 116
obligation rules 156
on-demand 16, 37
online marketing 44
ontologies 51, 58, 251
open deployment 29, 38
optimal routing 53
optimal solution 48
oscillator circuit 197
overclaiming 93
overshadowing 83

P
packet delivery ratio (PDR) 82
packet forwarding 89, 90, 91, 92, 95, 97
packet forwarding network 89
packet send ratio (PSR) 82
page rank 55
parallelizable 87
path consistency 96
pattern matching 200, 214
peer-to-peer (P2P) 127, 128, 129, 130
physicalism 195
physical layer 80, 81, 82, 83, 84, 85, 86, 87, 88, 90, 98
physical layer confidentiality 84
physical layer identity 84
physical layer integrity 83, 87
physical networks 16, 22
physiological 198, 222
pi-calculus 136
placement error 63
plethora 15
pointwise 56
policy analysis 108, 109, 111, 119
policy authoring 104, 107, 108, 109, 118
policy authoring and management tool (PAMT) 109
policy authoring tool (PAT) 109, 110
policy comparison 152
policy control 118
policy decision point (PDP) 105, 109, 110, 114, 115, 118
policy deployment 121
policy enforcement point (PEP) 105, 109, 114, 115, 118
policy explanation 181
policy lifecycle 104, 105, 112, 118, 119
policy management library (PML) 109, 110, 113
policy model 138
policy negotiation 175, 188
policy presentation 181, 182
policy refinement 11
policy regulation 155
policy repository 106, 109, 113, 114, 118
policy service 122
policy translation 8
power-law 44
preferential attachment 113
pretty secure BGP (psBGP) 93, 95, 96, 102
probabilistic technique 47
problem space 177, 189
processing technologies 181
protocol translation 9
prototype 147, 159, 160, 163, 164, 165, 166, 167, 168, 169, 170
provenance 21, 24, 35
public key 91, 92, 93
public key infrastructure (PKI) 79, 87, 90, 95, 96, 98
puzzle solving 193

Q
quality of information (QoI) 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 40
quality of service (QoS) 19, 20, 22, 23, 30, 31, 40, 41

R
radio frequency (RF) 88
radiometric fingerprinting 88, 98
random matrix theory (RMT) 56
random placement 64, 66, 73, 74
random walk matrix 56
RBAC 115, 157
reachability 53, 58, 59
reactive domain 6, 9
redundancy 50
refinement checking 151
representative patterns 51
resource description framework 209
resurrecting duckling 88
RF localization 88
role-based infrastructure 123, 144
routing gateways 81
routing protocols 1, 2, 3, 4, 5, 6, 7, 10, 12, 13, 79, 81, 83, 88, 89, 90, 91, 92, 93, 98, 99

S
schema matching 45
secure origin BGP (so-BGP) 93, 95, 96
security goals 148, 150, 151
security management 146, 147
self-managed 121, 123, 144
self-managed cell (SMC) 122, 123, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143
self-organization 211, 213, 235
semantic backplane 149
semantic information 207
Semantic Web 208, 226, 228, 230, 231
semi-circular law 56, 57
semi-structured data 47, 51
sensor deployment 64, 73, 77
sensor-enabled applications 15, 18, 23, 28, 38
sensor networks 64, 75, 76, 77
sensory stimulation 210
separation of duty 122, 123
service oriented architecture (SOA) 112
service requirements 20
shared bus 131, 132
shared situation awareness 16, 17
SHARP 5, 14
ship navigation 193, 220
signaling protocol 3
simple policy language (SPL) 104, 109, 116, 120
situational context 176
socially-extended cognition 193, 212, 213
social networks 42, 43, 44, 46, 48, 49, 50, 52, 53, 54, 55, 57, 58, 61
software design 126
software design patterns 126
SPARCLE 160, 161, 162, 165, 166
spatiotemporal 23, 25, 35, 36, 82, 92
specification layer 149, 150
spectral graph theory 55
spoofing 79
static algorithm 55
static separation 152, 157
statistical analysis 184
storage cost multiplier 83
store-and-forward 133
structural activity 46
structural behavior 42, 43, 44, 45, 47, 57, 58
structural graph 42
structural mining 45
structured query language (SQL) 112, 113, 114, 118
sub-networks 1
sub-vocalization 207
symmetric key 91, 96
synopsis construction 54
system architecture 105
system behaviors 147, 158
system management 20
Index

T

task-allocation 129, 130, 131, 134, 135, 140, 142
taxonomic externalism 195
team communications 258, 269
theater of operation 15
theoretical analysis 174, 176
time constraint 153, 154	
timescales 121
training data 45, 46
transmission delays 22
transparent deployment 106
trust criterion 205

U

unattended aerial vehicle (UAV) 28
uncoordinated frequency hopping (UFH) 86, 87
underlying structure 45
unfit 21
unification 3
universality principal 57
unmanned autonomous vehicle (UAV) 122, 127, 128, 130, 132, 133, 136, 143

V

validity checking 151
value of information (VoI) 15, 21, 22, 23, 24, 27, 30, 32, 34, 36, 37, 38, 39
vehicle externalism 193, 195, 196, 199, 233
velocity 23, 25, 30
vertex classification 45, 46
vertex cut 90
viral marketing 44
viral spread 45, 54
virtual table interface (VTI) 114
visualization tool 136

W

Watson Policy Management Library (WPML) 116, 118
Web applications 49
web of trust 95
Web ontology language 209
wide computationalism 200
wireless fingerprinting 79
wireless sensor networks (WSN) 17

Z

zone depth 25, 26, 28