Index

0-gateway node 42
1-gateway node 42
2D-ABBA 55
2-gateway node 42
3D-ABBA 55

Acceptance-based algorithm 18
Access point (AP) 133
Active selection method 114
Active sensing neighbors discovery 82
Active state modeling 11
Activity scheduling 34, 76
Actuator-actuator coordination 13, 118, 233, 234, 237
Ad hoc on-demand distance vector (AODV) 58, 96, 129
Adaptive demand-driven multicast routing (ADMR) 129
Adaptive flooding 62
Adjustable transmission range
Anchor node 217
Angular relaying 115, 116
Anycasting 14, 24, 127, 135, 147–149, 235, 271, 272
Approximation/performance ratio 39
Area dominating set 81
Area-based beaconless broadcasting algorithm (ABBA) 49, 50
Area-based collaborative sleeping (ACOS) protocol 84
Asymptotic optimality 113
Asynchronous protocol 78
Auction aggregate protocol 242
Automated architecture 13
Backbone-based broadcasting 49, 52, 54
Backtracking-based sensor deployment (BT) 268, 269
Beaconless forwarder planarization (BFP) 115, 116
Beaconless georouting 25, 114, 115
Beaconless routing (BLR) 114, 115, 122
Bellman-Ford algorithm 26
Biconnected network 22, 198, 200
Blind flooding 48, 50, 59, 60
Bluetooth 20, 21
Bluetooth radio 17
B-MAC 22
Broadcast incremental power (BIP) algorithm 66, 67
Broadcast-based sensor relocation 287
Broadcasting 22–24, 33, 34, 48–50, 52–64, 66, 67, 69, 70
BTnodes 17
Bulged slices 57
Card-dealer algorithm 245
CDS-based backbone 34, 63
CDS-based broadcast algorithm 54, 60, 62
Cluster-based coverage maintenance approach 271
Clusterhead (CH) 23, 34, 36, 172, 234, 277
Clustering-based backbone 34, 36
Communication backbone 76
Compass routing 98
Component neighbor elimination-based flooding 62
Connected dominating sets (CDSs) 22, 38, 140, 193
Connecting-dominating set-based backbone 34, 38
Contention-based forwarding (CBF) 114
Cooperative architecture 13
Cost over progress ratio 132, 146, 149, 181
Data aggregation 5–7, 21, 96, 168, 189–191, 193, 236

By Amiya Nayak and Ivan Stoimenovic. Copyright © 2010 John Wiley & Sons, Inc.
Data delivery tree 234, 236
Data dissemination 33, 162, 167, 170–172, 175, 176, 178, 181, 215, 216
Data gathering 5, 6, 21, 63, 153, 160, 161, 169, 171
Delay-constrained forwarding subset (DCFS) 118
Delay-constrained geographic-based routing (DC-GEO) 118
Delaunay triangulation (DT) 108, 109
Delay-tolerant WSN 161, 162
Depth first search (DFS) 103, 138, 140, 250, 256
Depth first search (DFS)-based routing 103, 255
Depth-constrained geographic-based routing (DC-GEO) 118
Desired hop progress (DHP) 192, 193
Designated gateway (DG) 171
Dijkstra’s shortest path algorithm 25
Direct migration 266
Direction-based routing 97–99
Direction-based update 214
disperseUniformly algorithm 248
Distributed mobility-adaptive clustering (DMAC) 38
Dominating set 22, 23, 38, 111, 113, 171
Dominating set-based backbone 63
Dominator 38
Doubling circle update 213
Duty cycling 30, 76
Dynamic optimal progress routing (DOPR) 254
Dynamic source routing (DSR) 58, 96

Edge sorting algorithm 19
Efficient flooding 55
End-to-end routing (EER) 121
Energy consumption 10, 121, 156
Energy consumption model 156
Energy hole 7, 154
Energy-efficient backbones 33
Energy-weighted shortest path (ESP) 149
Event-driven reporting 4, 5
Event-driven partitioning 235
Expanding ring search location service 218
Expected hop count (EHC) 8, 9, 58
Expected progress routing (EPR) 120, 121
Extreme-comm algorithm 244
Face routing 102, 105, 107, 109, 110, 113, 115, 122, 131, 189, 271, 272, 290
f-greedy 103
Flat home region 225
Flooding-based location service 210, 212
Flooding-based routing 96
Flying robots 258
Forbidden region 65, 107, 115, 116
Frequency hopping 20
Friis ground model 8
frontierGuidedDispersion algorithm 248
Gabriel graph 23, 95, 102, 107, 108
Genetic algorithm-based sensor self-deployment 286
Geocasting 24, 127, 134–136, 138, 140, 141
Geographic routing 95, 97, 98, 118, 120, 130, 209
Geographic routing by adaptive targeting (RAT) 118
Geographic unicast 130, 133
Geographical adaptive fidelity (GAF) 35, 38
Geographic-routing-based update 215
Geometric graph 105, 107
Georouting 24, 25, 95–97, 100, 102, 105, 113, 114, 117, 118, 120
Global positioning system (GPS) 97, 209
Greedy maximum residual energy (GMRE) strategy 175
Greedy other adaptive face routing plus (GOAFR+) 113
Greedy perimeter stateless routing (GPSR) 111
Greedy routing 26, 97, 98, 100–103, 105, 109, 110, 114, 115, 117, 131, 181, 255
Greedy set cover algorithm 47
Greedy-face-greedy (GFG) 110, 131, 136, 210, 272
Greedy-rotation-greedy (GRG) 197, 282
Grid location service (GLS) 227
Grid partitioning-based backbone 34, 35
Guha-Khuller algorithm 39, 47

Hamilton cycle-based sensor relocation 291
Hello message 10, 38, 42, 46, 47, 54, 59, 60, 82, 87, 114, 171, 186, 200, 202, 215, 243
Hidden node 115, 116
Hierarchical home region 227
Hierarchical ring quorum 224
Hierarchical spiral quorum 222
Home-agent-based location service 225
Home-based location service 211, 225
Hybrid energy-efficient tree-based optimized routing (HECTOR) 117
Hybrid learning-enforced time domain routing (HLETDR) 178
Hyper flooding 60, 61
Implicit geographic forwarding (IGF) 114
Incremental sensor deployment approach 284
Information mesh 221
Inside-out power (INOP) 70
Integer linear programming (ILP) 175, 235, 239
Intermediate navigator (IN) 171
Iterative expected progress routing (InEPR) 121
Iterative improvement method 101
Junction node 169
k-cover 81
k-coverage 79, 88
k-Dominating set (k-DS) 63
k-hop auction aggregation protocol (k-AAP) 243
k-hop simple auction aggregation protocol (k-SAAP) 243
k-Independent dominating set (k-IDS) 63
k-layer coverage 89
Layered pruning algorithm 47
LEACH protocol 36
Least recently visited (LRV) approach 266
Lightweight adaptive multicast (LAM) 130
Link quality indicator (LQI) 119
Load-balancing sensor self-deployment 277
Local localized protocol 25, 26
Localized broadcast incremental power (LBIP) 67
Localized broadcast oriented protocol (LBOP) 68
Localized minimal spanning tree (LMST) 64, 65, 70, 188
Localized minimal tree-based distance (LD) 192
Localized mobility control 22
Localized power-aware routing 100
Localized power-efficient data aggregation protocols (L-PEDAPs) 191
Localized shortest path tree (LSPT) 69, 70
Location service 25, 209
Location update policies 211
Lognormal shadowing model 8, 89, 120
MAC layer 20, 29, 53, 86, 136
Maximal independent set (MIS) 34
Maximum degree constraint 18, 19
Maximum degree proximity algorithm (MAX-DPA) 19
Maximum rate multicast (MRM) 144, 145
Max-min battery capacity routing 11
Memorization-based georouting 103
Memoryless routing 103, 105
Mesh quorum 221
Mesh-based sensor relocation protocol (MSRP) 290
MICA mote 27
MICA2 mote 27
Micro air vehicles (MAVs) 28
Minimal energy broadcasting 66
Minimal spanning tree (MST) 26, 64–68, 108, 165, 168, 186–188
Minimum connected dominating set 39, 40
Minimum degree proximity algorithm (MIN-DPA) 18
Minimum power over progress routing (MPoPR) 255
Min-power graph 186
MIS-based algorithm 40
Mixed integer linear programming (MILP) 161, 174, 175
Mixed integer nonlinear program (MINLP) 239
Most experienced delay (MED) 193
Most forward within radius (MFR) routing 98
Movement-assisted sensor placement 264
MPR-based broadcasting 54, 67
MPR-CDS algorithm 47
Multicast ad hoc on-demand distance vector (MAODV) 129
Multicasting 23, 127, 140, 143
Multihop route to mobile element (MRME) algorithm 165
Multipath fading 20, 119
Multipoint relays (MPRs) 47
Multipurpose aerial robot vehicles with intelligent navigation (MARVIN) 258
Multiratecasting 127, 143 Multirobot systems (MRS) 236
Navigation agent (NA) 171
Nearest neighbor with forward progress (NFP) method 98
Nearest neighbor-based node scheduling scheme 88
Negative reinforcement 179
Neighbor detection 33, 58, 59
Neighbor discovery 22, 38, 82
Neighbor elimination scheme 49, 50
Neighbor elimination-based algorithm 51
Neighbor number-based node scheduling scheme 88
Net area ratio 85
Net sensing region 84
Non-geographic multicast 128
On-demand reporting 4
On-tree self-pruning rebroadcast (OSR) algorithm 53
Operational range assignment protocol (ORAP) 91
Optimal hop count routing (OHCR) 252
Optimal hop count routing with depth first search (OHCR-DFS) 256
Optimal on-tree forward node selection (OOS) algorithm 54
Optimal rate cost multicast (ORCM) 144, 145
Ordinal pruning 46 Packet reception probability 122
Parameterless broadcasting 59–61
Partition-based scheduling (PBS) 164
Peeling phenomenon 175, 176
Perimeter-based coverage maintenance approach 272
p-hop critical 200, 201, 212
Physical layer model 20
Physical layer-aware routing 8
Physical layer-based sensing 75, 89
Planar geometric graph 105
Planar graph 105, 108
Point of interest (POI) 197
Point-coverage sensor self-deployment approach 280
Polynomial-time approximation scheme (PTAS) 40
Position-based routing 23
Positive reinforcement 179
Power consumption model 10, 155
Power metric 9–11, 67
Power-aware routing 154
Probabilistic flooding scheme 25
Probability-based node scheduling scheme 88
Probing environment and adaptive sleeping (PEAS) 83, 84
Proximity constraint 18
QoS metrics 11
QoS routing 23
Quasi-local localized protocol 26
Quorum-based location service 211, 219
Quorum-based sensor relocation 289
Random movement (RM) strategy 175
Random-choice algorithm 244
Rate-based metric 144
Rate-based multicast 143
Realistic medium access control (MAC) layer 8, 15, 20, 22, 29, 53, 86, 87, 95, 114, 136, 144
Realistic physical layer 10, 33, 42, 58, 59, 87, 89, 120
Received signal strength indicator (RSSI) 119
Receiver-based protocol 49
Region of interest (ROI) 263
Rejection-based algorithm 18
Relative energetic distance 180
Relative neighborhood graph (RNG) 64, 65, 109, 191
Reluctance 10
Rendezvous point (RP) 133, 167
Request zone search location service 217
Residual energy 11, 38, 82, 91, 101, 118, 119, 172, 173, 193
Resource-aware and link quality-based (RLQ) routing 119
Responsibility-based flooding scheme (RBS) 51
Retransmissions after negative acknowledgements (RANA) protocol 53
Retreat message 86, 87
RF noise 20
Robot-robot coordination 240
Route discovery 58
Scalable energy-efficient asynchronous dissemination (SEAD) 176
Search quorum 211
Sender-based protocol 49
Self-pruning algorithm 46, 72, 82
Semiautomated architecture 13
Sensing backbone 76
Sensing radii (SR) 76, 77
Sensor area coverage 75
Sensor relocation 25, 265, 287
Sensor self-deployment 265, 272
Sensor-actuator coordination 13, 233
Sensor-sensor coordination 13
s-hello protocol 59
Shifted migration 266
Shortest path routing 25
Signal-to-noise ratio (SNR) 8, 119
Simple auction aggregation protocol (SAAP) 243
Simple auction protocol (SAP) 241
Sink mobility 172
Sink relocation 172
Slice-based broadcasting algorithm 57
S-MAC 22
Smart dust 27
Snake-like deployment (SLD) approach 268
Steiner minimum tree (SMT) 170, 176
Steiner point 170
Steiner tree 129
Strip quorum 219
Stochastic sensor self-deployment approach 279
Sun SPOT 27
Synchronization protocol 77
Synchronous sensor area coverage 85
Target radius localized broadcast oriented protocol (TR-LBOP) 69
Target-density protocol 59
Task assignment problem 238
TinyNode sensor mote 11
TinyOS 27
T-MAC 22
Topology control problem 22
Total power consumption 10, 24
Transducer 12
Transmission area 17, 55
Transmission latency 5, 8
Transmission power 8, 10, 22, 33, 66, 70, 186, 187, 252, 253, 255
Transmission radius 7–10, 14, 17–20, 35, 45, 55, 67–70, 78, 81, 86, 99, 155–159, 186, 226
Traveling salesman problem (TSP) 163
Traveling salesman with neighborhood (TSPN) 163
Tree-based broadcasting 53
Tree-recolor algorithm 245
Triangle tessellation 197, 203
Triangular distance 180
Two-ray ground model 8
Unit disk graph (UDG) 7, 34, 77, 107, 186
Unit disk graph modeling 77
Unit disk graph-based distance (UD) 192
Unmanned airborne vehicle (UAV) 25
Update quorum 211
Virtual forces 248
Virtual machine (VM) 27
Virtual-force-based sensor self-deployment 273
Voronoi-based sensor self-deployment 275
Weighted entropy 180
Weighted entropy data dissemination (WEDAS) 179
<table>
<thead>
<tr>
<th>Term</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weighted path routing</td>
<td>25, 102</td>
</tr>
<tr>
<td>Wireless personal area networks</td>
<td>(WPANs) 20, 21</td>
</tr>
<tr>
<td>Wireless sensor actuator networks</td>
<td>(WSANs) 12–21, 48, 76, 90, 97, 234, 236–238, 263, 272</td>
</tr>
<tr>
<td>Wireless sensor and robot network</td>
<td>(WSRN) 237, 240</td>
</tr>
<tr>
<td>Wireless sensor networks (WSNs)</td>
<td>1, 3–5, 7, 10–13, 20, 21, 75, 84, 88, 153, 155, 161, 176, 233</td>
</tr>
<tr>
<td>Withdrawal message</td>
<td>86</td>
</tr>
<tr>
<td>Zigbee</td>
<td>9, 20, 21, 54, 77</td>
</tr>
<tr>
<td>Zigbee on-tree selection (ZOS) algorithm</td>
<td>44</td>
</tr>
<tr>
<td>Zone-based sensor relocation</td>
<td>289</td>
</tr>
</tbody>
</table>