Index

abort, 68–69
access, 58
Activated Rules (AR), 27, 32
Active self-evolving pattern, 15
add, 57
address, 52
ADDRESS, 48
advance, 60–61
Advancement, 60–62
Aerial scenario, 125–126
align, 62
all, 44
allother, 44
allowed, 67–68
and, 64
and_parallel, 64
and_sequence, 64
any, 44
Any path between nodes, 80–81
append, 58
apply, 58
Armed conflicts, 11–12
Articulation points, 88
assign, 60
Assignment, 60
assignpeers, 60
asynchronous, 45
attach, 57
Automatic command and control, 31–34
average, 56–57

BACK, 49
Backward, 45
Battle-related deaths, 12
belong, 59
bigger, 59
blind, 68–69
branch, 62–63
Branching, 62–65

call, 66
center, 52
Center for Security Studies (CSS), 13
Centralized security bodies, 132
Centres of communities, 90–91
Changing network structures, 88–90
choose, 64
Climate change, 1
Cliques, 87–88
Collective evacuation, 77–78
Collision avoidance, 98–99
Command and Control (C2) network, 94
common, 58
Communication Processor (CP), 30
Complexly moving objects, 95–97
Components of SGL interpreter, 25
Compound constants, 45–46
Conflicts, 2
constant, 52
Constants, 18
contain, 68
content, 52
CONTENT, 48
Controlling spread of conflict, 74–76
Control Processor (COP), 31
coordinate, 52
count, 56
create, 54–55

Creation, 54–55
Crisis and security management, 1–2
`current`, 44
Custom constants, 43
Cyber attacks, 1–2
`cycle`, 65

Danger pattern, 106–109
DARPA mosaic concept, 3, 113–115
DARPA Mosaic Warfare concept, 3, 131–133
Data structures of the interpreter, 25–29
  Activated Rules (AR), 27
  Environmental Variables (EV), 28–29
  Frontal Variables (FV), 28
  Global Variables (GV), 29
  Grasps Identities (GI), 28
  Grasps Queue (GQ), 26
  Heritable Variables (HV), 28
  Incoming Queue (IQ), 29
  Knowledge Network (KN), 27
  Nodal Variables (NV), 28
  Outgoing Queue (OQ), 29
  Suspended Grasps (SG), 26
  Track Forest (TF), 27
`decrement`, 58
`degree`, 57
`delete`, 55
`direct`, 45
`DIRECTION`, 50
Disaster zone, 77–78
Distances, 90–91
Distributed driverless platoon management, 126–128
Distributed infrastructures, 17, 19
Distributed mosaic simulation
  DARPA mosaic concept, 113–115
  distributed driverless platoon management, 126–128
  hierarchical command and control, 122–125
  SGT-based, 116–122
  swarm against swarm aerial scenario, 125–126
Distributed operations, 86–90
Distributed sensor networks, 95–97
`divide`, 57
`doer`, 53
`DOER`, 49
`done`, 23, 44
Driverless platoon management, 126–128

Echoed space navigation, 98–99
Echoing, 55–59
Echoing via tracks, 33
`element`, 57
Elementary programming examples, 70–71
`emit`, 67
`empty`, 59
`engaged`, 45
`environmental`, 52
Environmental dangers, 10–11
Environmental variables (EV), 22, 28–29, 48–51
Epidemics, 9–10
`equal`, 59
Exchange, 66–67
Execution-physical world (EPW), 20
`executive`, 45
Executive world (EW), 19–20
`existing`, 45
Explored features, 131–133

`fail`, 23, 44
`fatal`, 23, 44

Finding strongest sub-networks, 87–88
Finding suspects, 73–74
`first`, 56–57
`firstcome`, 45
`follow`, 54
`forward`, 45
Forward grasping, 32–33
`free`, 68
`fringe`, 62
`fromto`, 57
`frontal`, 52
Frontal variables (FV), 22, 28, 31, 47
Functional processors of the interpreter, 29–31
  Communication Processor (CP), 30
  Control Processor (COP), 31
  Navigation Processor (NP), 30
  Operation Processors (OP), 30
  Parser (P), 30
  World Access Unit (WAU), 31
Future plans, 133–134

Gestalt explaining examples, 34
Gestalt psychology and theory, 133
`get`, 67
`global`, 52
Global peace index 2017, 12
Global security, 1–2
Global terrorism, 1–2
Global variables (GV), 22, 29, 46
Grasping, 69
Grasps, 45–46
Grasps identities (GI), 28
Grasps queue (GQ), 26
Grouping neighboring elements, 116–117

`heavier`, 59
`heritable`, 52
Heritable variables (HV), 22, 28, 31
Hierarchical command and control
  full scenario integration, 124–125
  networked units, initial distribution of, 122
  runtime infrastructure, 123
  swarm movement scenario, 122
  targets collection and distribution and impact, 123–124
  topologically central unit, 123
Hierarchical merge, 23–24
`hop`, 53
`hopfirst`, 53–54
`hopforth`, 54

`IDENTITY`, 50–51
`if`, 63
Impacting danger element, 117–122
`IN`, 51
Incoming queue (IQ), 29
`increment`, 58
`index`, 52
`infinite`, 44
Information, 42–43
  number, 42–43
  scenario, 42
  string, 42
`input`, 66
Internal armed conflict, 12
International conflicts
  nuclear war, probabilities of, 105
  relations complexity between countries, 103–104
  world nuclear powers and weapons distribution, 104–105

International Criminal Law (ICL), 11–12
International Humanitarian Law (IHL), 11–12
Internationalized internal armed conflict, 12
International Relations and Security Network (ISN), 13
International security, 1–2
International security bodies and measures, 13–14
  security networks, 13
  security technologies, 14
  United Nations, 13
International Security Networks, 14
Interoperability ideology, 5
Interpreter organization, SGL
  components and their interactions, 25
  data structures of, 25–29
  functional processors, 29–31
`intersect`, 59
Interstate armed conflict, 12
`invert`, 58

Knowledge infrastructures, 15–16
Knowledge network (KN), 27

`last`, 56–57
`less`, 59
`lessorequal`, 59
`lift`, 69
`lighter`, 59
`link`, 53
`LINK`, 50
`linkup`, 55
`location`, 58–59
`longer`, 59
`loop`, 65

Management models and technologies, 2–5
`matter`, 52
`max`, 56–57
`min`, 56–57
Missile defence management, 1–2
  main stages, 93–94
  scenario, 93–95
  in SGL, 94–95
`more`, 59
`moreorequal`, 59
Mosaic space, 116
`move`, 54
Movement, 53–54
Moving objects
  distributed sensor networks, 95–97
  missile defence scenario, 93–95
  refugees flow, 99–100
  space objects movement, 97–99
Multiplex world, 1
`multiply`, 57
Multi-source coverage, 16

`name`, 52
`NAME`, 48
Natural disasters, 1–2
Navigation processor (NP), 30
`neighbors`, 45
Network creation, 79–80
Networked structures
  articulation points, 88
  changing, 88–90
  sub-networks, or cliques, 87–88
Networked units, distribution, 122
Network management basics
  network creation, 79–80
  path between nodes, 80–81
  routing tables (RT), 84–86
  Shortest Path Tree (SPT), 82–84
  Spanning Tree (ST), 81–82
`neutral`, 45

New organizational and management models and technologies, 2–5
nil, 44
no, 59
nodal, 52
Nodal variables (NV), 22, 28, 32
node, 53
nonempty, 59
nonequal, 59
notbelong, 59
notintersect, 59
Nuclear danger patterns
  complex 4-node danger pattern, 108–109
  multiple nodes, 109–112
  3-node danger pattern, 106–108
Nuclear war, 1, 105
Nuclear weapons, 2, 103
Number, 42–43
number, 52

Operation processors (OP), 30
or, 63
order, 56
Organizational models and technologies, 2–5
Organization of SGL interpreter components and their interactions, 25, 26
  data structures of, 25–29
  functional processors, 29–31
or_parallel, 63–64
or_sequence, 63
other, 44
OUT, 51
Outgoing queue (OQ), 29
output, 66
"Over-operability,", 5

parallel, 63
Parser (P), 30
passed, 44
Path between nodes, 80–81
Pattern with multiple nodes, 109–112
physical, 45
Physical matter, 43
Physical world (PW), 19
Platooning, 126
Post-liberal security, 1–2
PREDECESSOR, 49
PREVIOUS, 49
Probabilities of nuclear war, 105

Qualification, 68–69
QUALITIES, 49
quickest, 64
quit, 68–69

rake, 56
random, 56–57
range, 53
receive, 67
Recursive structure, 17–18
Refugees crises, 11
Refugees flow, 99–100
Relations complexity between countries, 103–104
release, 68
Religious conflicts, 1–2
repeat, 61–62
RESOURCES, 49–50
reverse, 57
Routing tables (RT), 84–86
Rules, 19
run, 66
Runtime infrastructure, 123

Scenario, 42
scenario, 52
Security issues in concrete areas, 9–13
  armed conflicts, 11–12
  environmental dangers, 10–11

epidemics, 9–10
refugees crises, 11
terrorism, 12–13
world religious diversity, 10
Security management
distributed sensor networks, 95–97
missile defence scenario, 93–95
refugees flow, 99–100
space objects movement, 97–99
Security networks, 13
Security related management
disaster zone, collective evacuation from, 77–78
finding suspects worldwide, 73–74
spread of conflict, 74–76
territorial conquest, distributed simulation of, 76–77
Security technologies, 14
`seize`, 69
Self-spreading spatial intelligence, 15
`send`, 66–67
Sensor network, 96
`separate`, 57
`sequence`, 63
SGL constants, 41–46
compound constants, or grasps, 45–46
custom constants, 43
information, 42–43
physical matter, 43
special constants, 44–45
SGL control states, 23–24
SGL distributed interpretation, 24–25
SGL interpreter organization, 25–34
components and organization, 25
data structures, 25–29
functional processors, 29–31
tracks-based automatic command and control, 31–34
SGL recursive structure, 18
SGL rules, 51–69
advancement, 60–62
assignment, 60
branching, 62–65
creation, 54–55
echoing, 55–59
exchange, 66–67
grasping, 69
movement, 53–54
qualification, 68–69
timing, 67–68
transference, 66
type, 51–52
usage, 52–53
verification, 59
SGL syntax and main constructs, 37–39
SGL variables, 46–51
environmental variables, 48–51
frontal variables, 47
global variables, 46
heritable variables, 46–47
nodal variables, 47–48
`shift`, 54
`shorter`, 59
Shortest Path Tree (SPT), 82–84
`sleep`, 67
`slide`, 61
`sling`, 65
`smaller`, 59
`sortdown`, 57
`sortup`, 57
Space navigation with collision avoidance, 98–99
Space objects movement, 97–99
space navigation with collision avoidance, 98–99
virtual object copies, 97–98

Spanning Tree (ST), 81–82
Spatial control, moving objects
  distributed sensor networks, 95–97
  missile defence scenario, 93–95
  refugees flow, 99–100
  space objects movement, 97–99
Spatial grasp language (SGL), 4
  basic elements, 18–19
  constants, 18, 41–46
  control states and their hierarchical merge, 23–24
  details, 19–24
  distributed interpretation, 24–25
  elementary programming examples in, 70–71
  features, 16–24
  Gestalt psychology and theory, 34–35
  idea, 15–16
  interpreter organization, 25–34
    components and organization, 25
    data structures, 25–29
    functional processors, 29–31
    tracks-based automatic command and control, 31–34
  recursive structure, 17–18
  rules, 19, 51–69
  scenarios, 20–21
  sense and nature, rules, 21–22
  syntax and main constructs, 37–39
  top-level, 39–41
  variables, 18–19, 22–23, 46–51
  worlds, 19–20
Spatial grasp model. *See* Spatial grasp language (SGL)
Spatial grasp paradigm, 4–5
Spatial grasp technology (SGT), 1–2, 115
  distributed mosaic simulation
    collective surrounding and danger element impact, 117–122
    grouping particular type neighboring elements, 116–117
    mosaic space, networked representation of, 116
  idea, 15–16
Special constants, 44–45
`speed`, 52
`split`, 65–66
Spreading spatial patterns, 17
`state`, 56
`STATE`, 50
`STATUS`, 51
`stay`, 69
String, 42
`string`, 52
Sub-networks, 87–88
`subtract`, 57
`sum`, 56
Suspended Grasps (SG), 26, 32
Swarm against swarm, 125–126
Swarming, 113, 122–125
Swarm movement scenario, 122
Swiss-sponsored International Security Forum (ISF), 13
`synchronous`, 45
"System of systems" model, 3

Technological disruption, 1
Territorial conquest, 76–77
Terrorism, 12–13
`thru`, 23, 44
`time`, 52
`TIME`, 50
Timing, 67–68
Topologically central unit, 123

Tracing moving objects, 95–97
Track components, 31–32
Track Forest (TF), 27
Track links, 31
Track nodes, 31
Tracks-based automatic command and control
  components and links, 31–32
  development via tracks, 33–34
  echoing via tracks, 33
  tracks-based forward grasping, 32–33
Tracks optimization, 32
Transference, 66
Type, 51–52
`TYPE`, 48

`unique`, 45
`unit`, 56
`unite`, 57
United Nations, 13
`unlink`, 55
Unmanned, 3, 4–5, 16–17, 113–114
UN Security Council, 13
Usage, 52–53

`vacant`, 45
`VALUE`, 50
Variables, 18–19, 22–23, 46–51
  environmental, 48–51
  frontal, 47
  global, 46
  heritable, 46–47
  nodal, 47–48
Verification, 59
`virtual`, 45
Virtual-execution-physical world (VEPW), 20
Virtual-Execution World (VEW), 20
Virtual object copies, 97–98
Virtual-physical world (VPW), 20
Virtual world (VW), 19

WAVE, 4–5, 15, 133
Weapons distribution, 104–105
`WHEN`, 50
`WHERE`, 49
`whirl`, 65
`withdraw`, 58
Word crises, 132
Word security problems, 131–133
World Access Unit (WAU), 31
World crisis, 133
World dynamics, 1–2
World nodes, 32
World nuclear powers and weapons distribution, 104–105
World religious diversity, 10

`yes`, 59