

# Index

- acknowledge, 83
- algebraic equivalence, 32
- arbiter, 51
  - distributed, 96
- ring, 96
- tree, 88
- asynchronous circuit, 2
- autofailure manifestation, 60, 63–64, 131–132
  - implementation of, 104
- autofailure, 60, 104, 130
- axiomatic method, 10
- basic circuit names, 27
- basic circuits, 27
- behavioral equivalence, 42, 54, 57
- behavioral interpretation, 37
- boolean gate, 46, 81, 134
- branching-time temporal logic, 11
- breadth-first search, 87
- Buchi automaton, 110
- C element, 53
  - for complete trace structures, 131
  - for prefix-closed trace structures, 62
- CCS, 8, 54
- choke, 61–62
- circuit algebra, 22, 24
  - expression, 32, 85
- free, 32
- homomorphism, 32
- isomorphism, 32
- normal form expression, 32, 86
- of canonical trace structures, 69
- of circuit structures, 29
- of complete trace structures, 127
- of prefix-closed trace structures, 42
- operations, 24
- circuit structure, 27
  - illegal, 28
- clock skew, 2
- Common LISP, 79
- complete trace structures, 123–124
- compose, 24
  - implementation of, 104
- of circuit structures, 29
- of complete trace structures, 127
- of prefix-closed trace structures, 42
- concurrency, 139
- conformation equivalence, 56, 59, 131
  - canonical form, 59, 131
- conformation, 56–57, 130
- decision procedure for complete trace structures, 132
- decision procedure for prefix-closed trace structures, 66
- monotonicity with respect to, 58
- sufficient condition for, 62
- conforms-to, 57
- CONFORMS-TO-P, 86
- control circuits, 3
- control/data distinction, 3
- CSP, 97
- delay insensitivity, 38, 56, 74
  - automatic check, 103

- delete, 39
- depth-first search, 86
- diagnostic trace, 87
- distributed mutual exclusion, 96
- distributed variables, 12
- environment, 57, 66, 76, 125, 139
- environmental assumptions, 56
- equivalence, 22
  - algebraic, 32
  - behavioral, 42, 54, 57
  - conformation, 56, 59, 131
- FF, 57
- structural, 27–28
- expression context, 57
- failure exclusion, 61, 64, 131, 133
  - implementation of, 105
- failure semantics of CSP, 9
- failure-free, 57, 61, 130
- failures, 38, 41
  - minimal, 62
- fairness, 138
- FF-equivalence, 57
- finite automata, 40
  - on finite sequences, 40
  - on infinite sequences, 110
- fork/join module, 71, 140
- four-phase signaling, 83
- game projection, 114
- hand-shaking protocols, 83
- hazard, 46
- hide, 26
  - implementation of, 105
  - of circuit structures, 30
  - of complete trace structures, 127
  - of prefix-closed trace structures, 42
- hierarchy, 5
- I/O automata, 13
- infinite games, 114, 125, 146
  - and autofailure, 130
  - and receptiveness, 126
  - deciding of winnability of, 116
  - practicality, 121
- infinite sequence, 107
- inter-process communication, 5
- intersection of trace structures, 42
- inverse delete, 39
- Kripke structure, 11
- lattice properties, 75
- lattice, 142
- LISP, 79
- liveness property, 4, 107, 123, 134
- macromodules, 7
- ME element, 52, 83, 137
- merge element, 69
  - alternating, 69
- metastable state, 51
- mirror, 66, 87, 132–133
  - of a complete trace structure, 132
  - of a prefix-closed trace structure, 66
- model checking, 11
- modularity, 5
- mutual exclusion, 51–52, 83, 137
  - distributed, 96
- node, 27
- NOR gate, 48, 134
- normal form, 32
- notation, 23, 39, 107
- overview, 17
- partial execution, 38
- performance, 88, 145
- PERQ, 79
- Petri nets, 14
- pin, 27
- pre-order, 59

- prefix chain, 108
  - limit of, 108
- prefix, 39
- prefix-closed trace structure, 38, 41
- prefix-closed, 39, 63
- product graph, 86
- quotient, 39, 63
- Ramsey's Theorem, 119
- reachability analysis, 15
- receptiveness, 37, 124
  - complete trace structures, 124
  - of complete trace structures, 126
  - of prefix-closed trace structures, 41
- regular expressions, 40
- rename, 24
  - implementation of, 104
  - of circuit structures, 30
  - of complete trace structures, 127
  - of prefix-closed trace structures, 42
- request, 83
- results, 16
- ring oscillator, 48, 136
- safe substitution, 55
- safety property, 4
- selector, 70, 126
- semi-modularity, 7
- set-reset latch, 49, 71
- simple prefix-closed trace structures, 62
- SM macro, 82
- specification, 4, 55
  - errors in, 99
- speed-independent, 2
- Spice LISP, 79
- stable, 46
- starvation, 138
- state machine synthesis, 6
- strategy, 114
- structural description, 21
- structural equivalence, 27–28
- structure, 21
  - flat, 21
  - hierarchical, 21
- subset construction, 105
- successes, 41
- suffix equivalence, 113, 131
- switch level, 4
- switch-level circuits, 151
- synthesis, 6
- temporal logic, 9
  - branching-time, 11
  - linear-time, 9
  - propositional, 10
- timing, 151
- trace structure, 37
- trace theory, 13
- trace, 37
- transition, 37
- tree models, 9, 11
- universal do-nothing module, 74, 123
- unstable, 46, 137
- vending machine, 54
- verification, 3
  - a posteriori, 6
  - hierarchical, 6, 55
  - meaning of, 4
  - modular, 5, 12
  - practicality of, 5
- wire, 24, 27
  - input, 24
  - output, 24
- XOR gate, 69