

Index

- \$FIB** supercombinator, 44
- + combinator, 39

- application, 5
- argument cell, 15, 105
- auto-incrementing pointer
 - access, 27, 31-32

- B** combinator, 118

- C** combinator, 119
- C programming language, 3,
 - 6, 19, 30-33, 47, 51,
 - 54, 58-59
- cache design parameter
 - associativity, 64, 75-76, 80, 82
 - block size, 63, 68, 73-75,
 - 81-82
 - organization, 64
 - replacement policy, 63-64, 76
 - size, 63-64, 68, 72-73, 75,
 - 79-80
 - write allocation, 64, 68,
 - 70-71, 79
 - write policy, 63-64, 77, 82
- cache memory, 33, 35, 63, 65,
 - 67, 69, 71, 73, 75,
 - 77-79, 82, 84-85,
 - 90-91
- cache memory
 - implementation
 - split, 35, 64, 69, 77, 79
 - unified, 64, 69, 76

- cache memory pre-touch, 34
- cache simulator, 63-64, 91
- case analysis, 10-11, 15, 18,
 - 21, 32, 42
- closure reduction, 6-8
- closures, **6-9**, 11-14, 55, 59,
 - 98
- combinator, 2-3, 7, **118-119**
- combinator graph reduction,
 - 2
- computational suspension,
 - 7-8, 11, 108

- DECstation 3100, 51, 57, 71,
 - 78-79, 82-83, 85,
 - 89-90
- delay slot
 - branch, 51, 93-94
 - load, 30, 35, 51
- dummy write, 35

- fib benchmark, 44, 50-53, 58,
 - 60, 64, 70, 78, 80, 84,
 - 89-90, 94
- first class objects, **6**, 101, 105
- Forth programming
 - language, 26-27, 95
- function cell, 15, 105
- functional programming, 1-2,
 - 5, 101, 121

- G-machine, 10, 13, 16-17, 55,
 - 99, 121

garbage collection, **8**, 11-12,
32, 38, 43, 45, 64, 75,
83-86
generational, 45, 73
mark/sweep, 45, 85
stop-and-copy, 45-46, 51, 70,
73, 85

graph reduction, 2, 5-10,
12-15, 19, 23, 26, 28,
36, 45-46, 56, 59,
70-73, 75, 79, 97-98,
101, 121-122

Haskell programming
language, 6
heap allocation, 85
Hyperlazy evaluation, 10, 55

I combinator, 37, **103**
IF combinator, 40-41
imperative language, 1, 3,
5-6, 8, 58, 98, 101
indirection node, 17-18, 108

jsb opcode, 12, 22-23, 33-34,
46, 55

K combinator, 38, **103**

lambda calculus, 2, 7, 13,
102-103
lazy evaluation, 1, **5-6**, 11,
58, 105
lazy functional
programming, 2, 5-9,
58, 98
Lazy ML, 6
LISP programming
language, 6, 41, 101
list manipulation
combinators, 41
LIT combinator, 39

locality
spatial, 73, 75, 98
temporal, 72-73, 75, 80, 82,
91

mapping of TIGRE onto
execution models, 31,
33, 35
memoize, 6
MIPS R2000, 25, 30-31,
35-36, 51, 58-59, 75,
82-83, 86, 89-93, 95
Miranda programming
language, 6, 9, 54
miss ratio, 64

nfib benchmark, 49-53, 55-56,
58, 60
non-strict combinator, 37-39
NORMA, 12, 56
normal order evaluation, **5**,
8, 11, 105, 109
nRAPS, 53
nthprime benchmark, 50-51,
58-59, 61, 78

P combinator, 42
parallelism, 2, 4, 6, 9, 12, 46,
57-58, 98, 121
Pascal programming
language, 6
projection combinators, 37

queens benchmark, 50-51, 78

RAPS, **49**, 52
referential transparency, **5**,
121

S combinator, 103
S' combinator, **28**, 32-33, 35

Index 155

SASL programming 59, 70-72, 74-75, 77,
language, 6 84, 91, 94, 97, 99, 120

Scheme programming
language, 57

self-modifying program
techniques, 14, 33,
35-36, 92-93

SK-combinators, 7, 9, **103**

SKI combinator set, 64, 70,
103, 105, 107, 109,
111, 113, 115

skifib benchmark, 50, 52, 64,
71, 82-83

special hardware support, 7,
9, 12, 14, 23, 56, 59,
89-90, 92, 94, 96-97

spine, **11**, 22-23, 111

spine stack, 16, 19-22, 25-27,
29, 31, 33, 46, 86, 93,
111

spine stack fixup, 85-86

strict combinator, 38-40, 105,
108

strict evaluation, 6, 57, 98

strictness analysis, 9, 43, 53,
56, 70, 97

subroutine return address
stack, 21-23, 25, 33,
86

supercombinator, 3, 9-11, 23,
43, 45, 50-51, 53-56,

tags, 11-12, 15-17, 23, 31, 35,
46, 57

tak benchmark, 50, 52

threaded interpretation, 12,
14, 19, 21, 26, 97

thunk, 6-7

TIGRE, 14-15

TIGRE abstract machine, 5,
25-29

TIM abstract machine, 11,
13, 56, 98-99, 121

traffic ratio, 64

translation lookaside buffer
(TLB), 75, 83

Turner Set, 9, 12, 17, 23,
37-38, 40-41, 43, 51,
59, 64, 70-71, 78, 97,
117, 119

U combinator, 43

VAX, 3, 16-17, 22-23, 25,
30-31, 33-35, 46, 55,
71, 94

VAX 8800, 33-35, 51, 71, 85

VAXstation 3200, 51, 55

virtual memory, 75, 83