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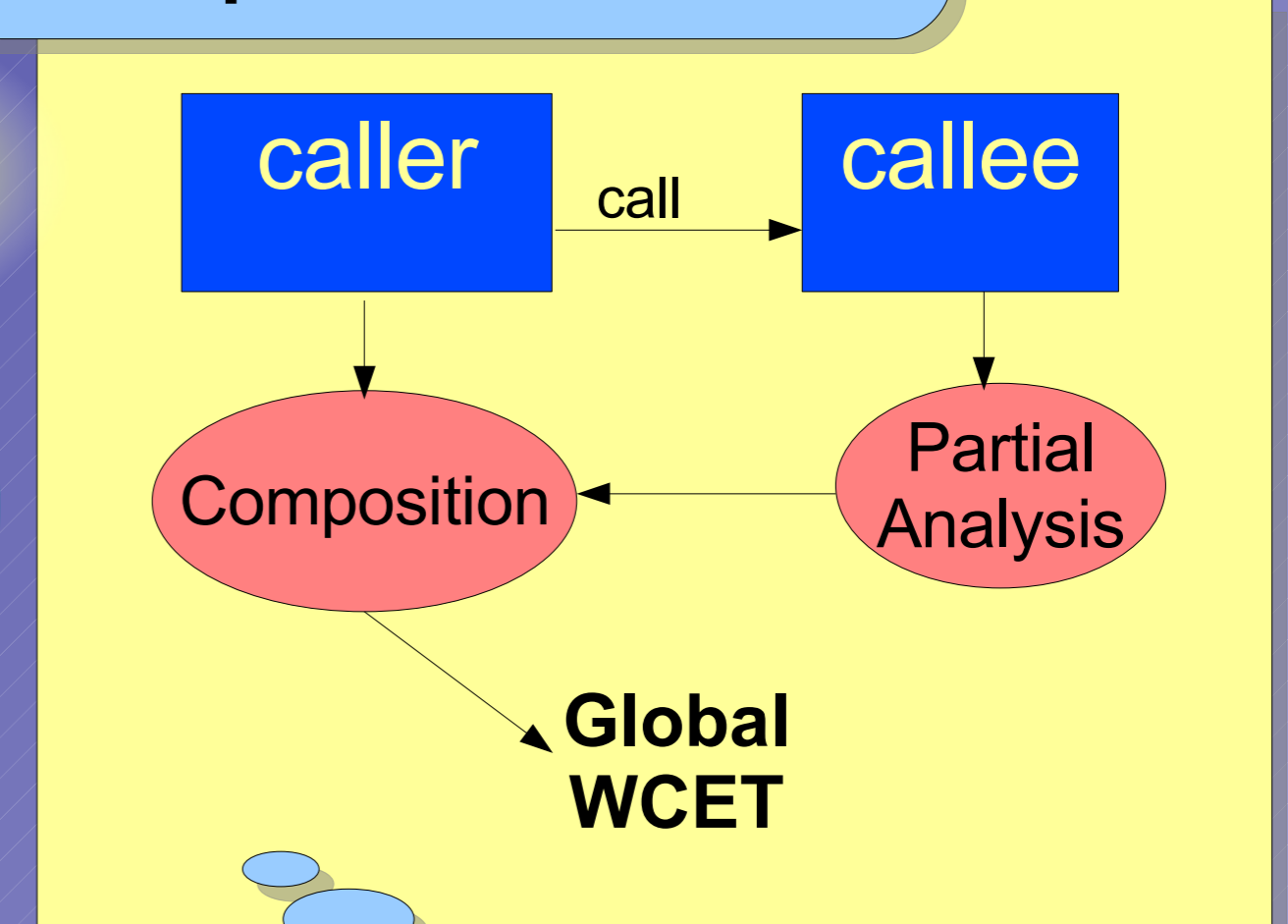
WCET Computation of Software Components by Partial Static Analysis

usual analysis process

caller   callee

call

return

0101 1010 1101

→ **WCET**
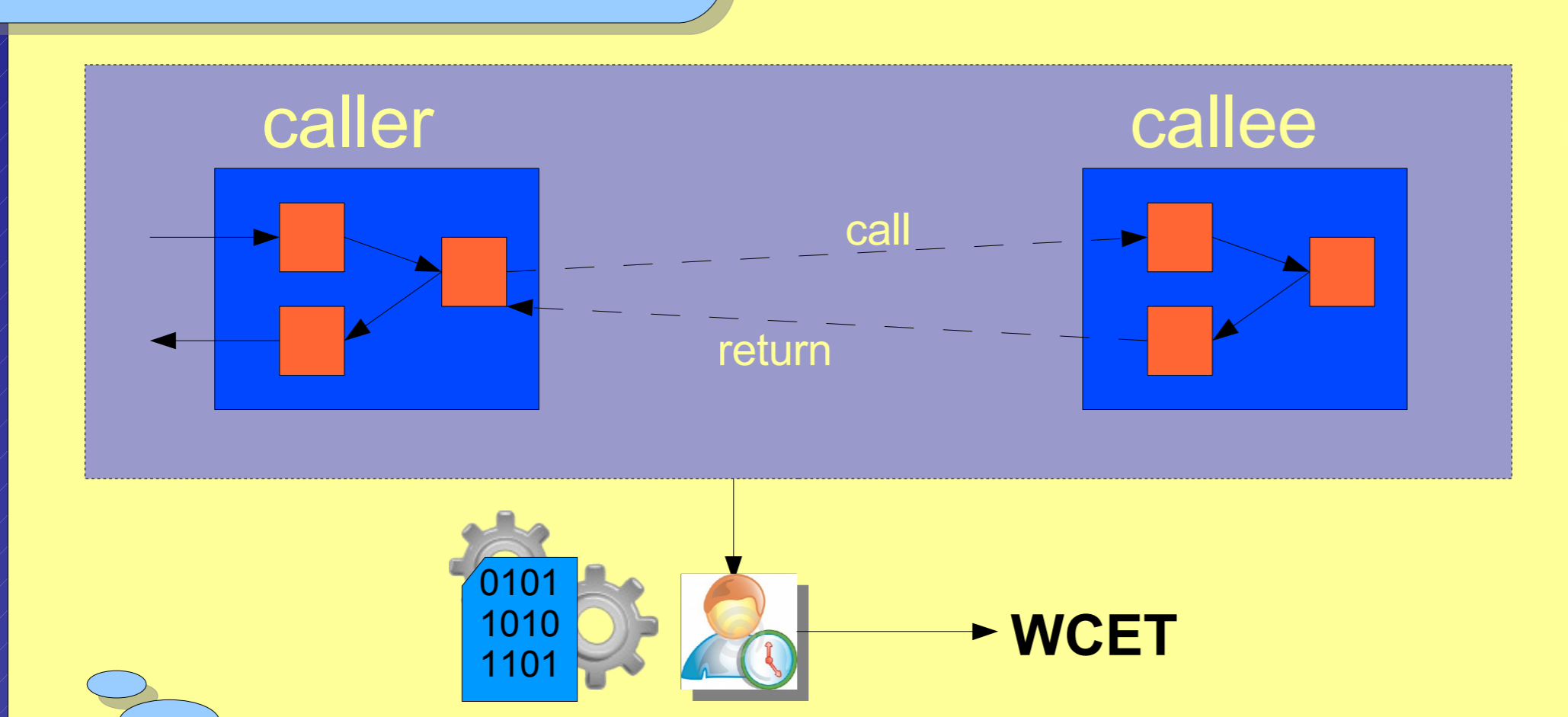
Exponential analysis time

Problem with unavailable components

partial analysis process

caller — call → callee

Composition ← Partial Analysis

→ **Global WCET**

Reduced analysis time

No problem with components.

building partial results

callee

Partial Analysis

→ **Transfer function**

→ **Summary function**

composing partial results

caller

transfer summary

WCET$_{caller}$ → Composition ← **WCET**$_{callee}$

→ **WCET**

Analysis time comparison

Time (msec)

75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0

fibcall matmul fft1 (1) fft1 (2) qurt fir (1) fir (2)

■ S.A. (msec)
■ P.A. (msec)
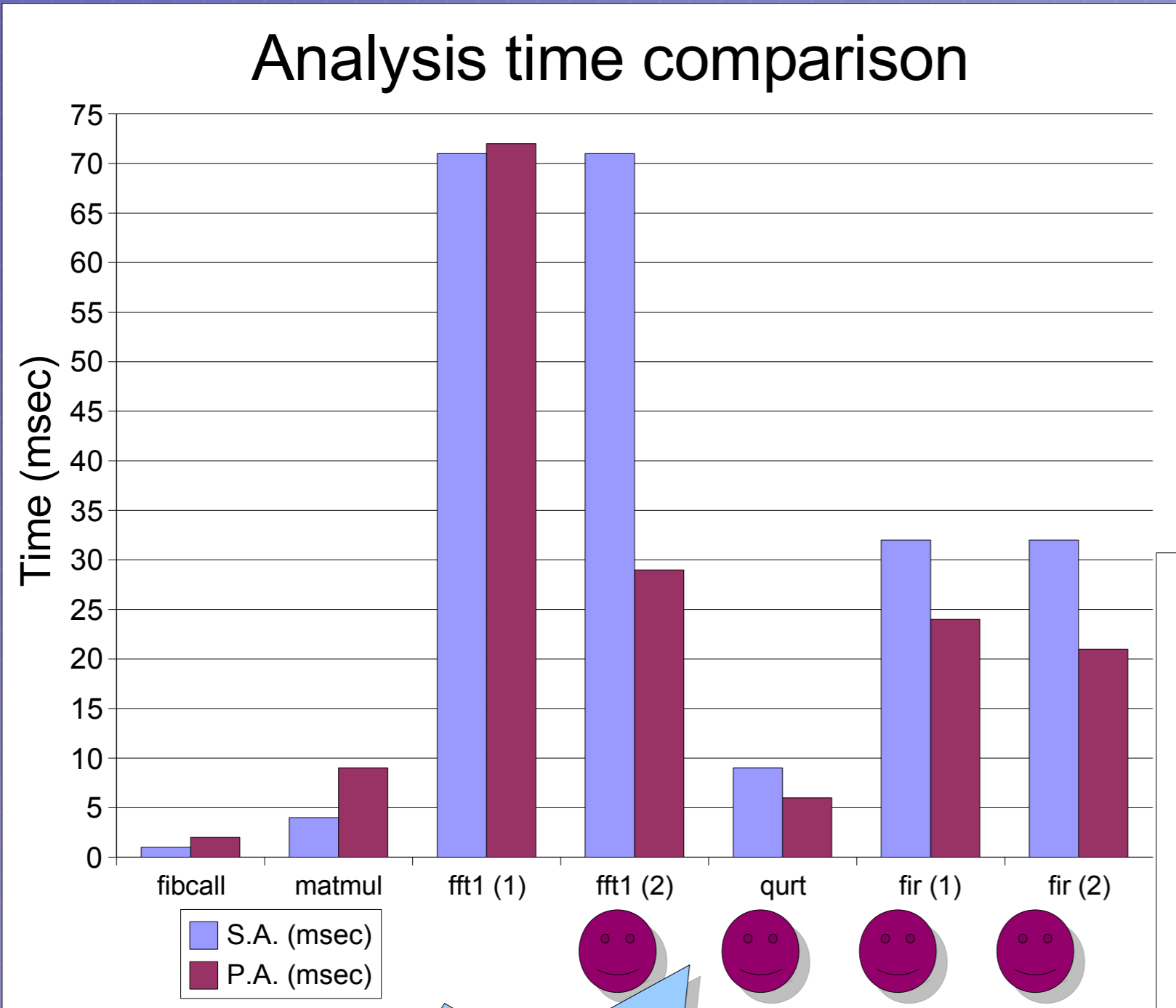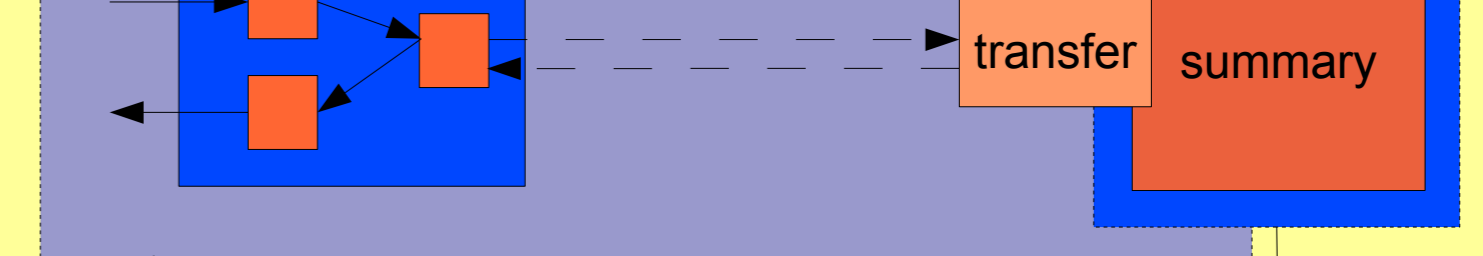
Analysis time gain
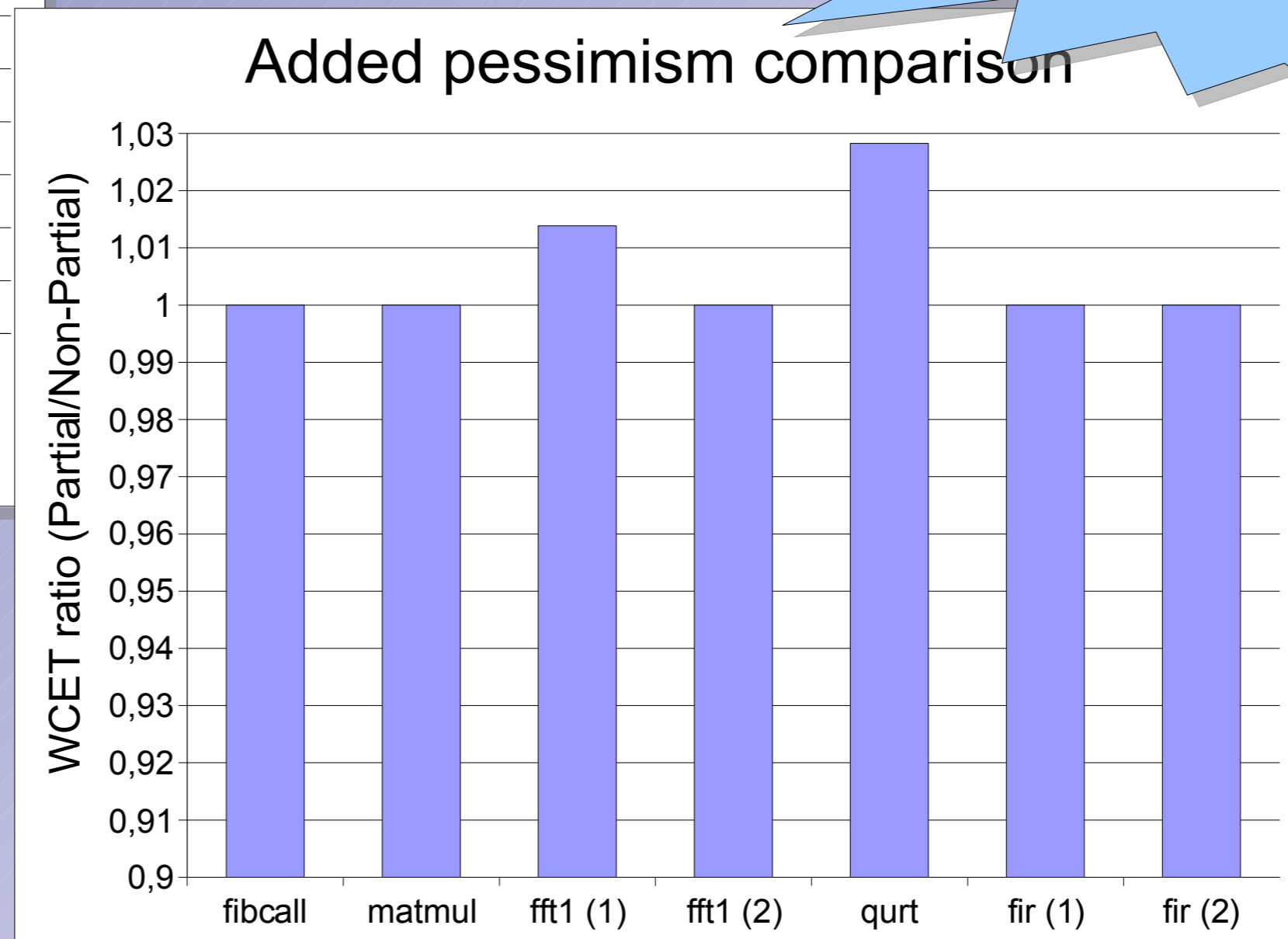
**Correct WCET
Few added pessimism**

Added pessimism comparison

WCET ratio (Partial/Non-Partial)

1,03
1,02
1,01
1
0,99
0,98
0,97
0,96
0,95
0,94
0,93
0,92
0,91
0,9

fibcall matmul fft1 (1) fft1 (2) qurt fir (1) fir (2)