# Are New Languages Necessary for Multicore?


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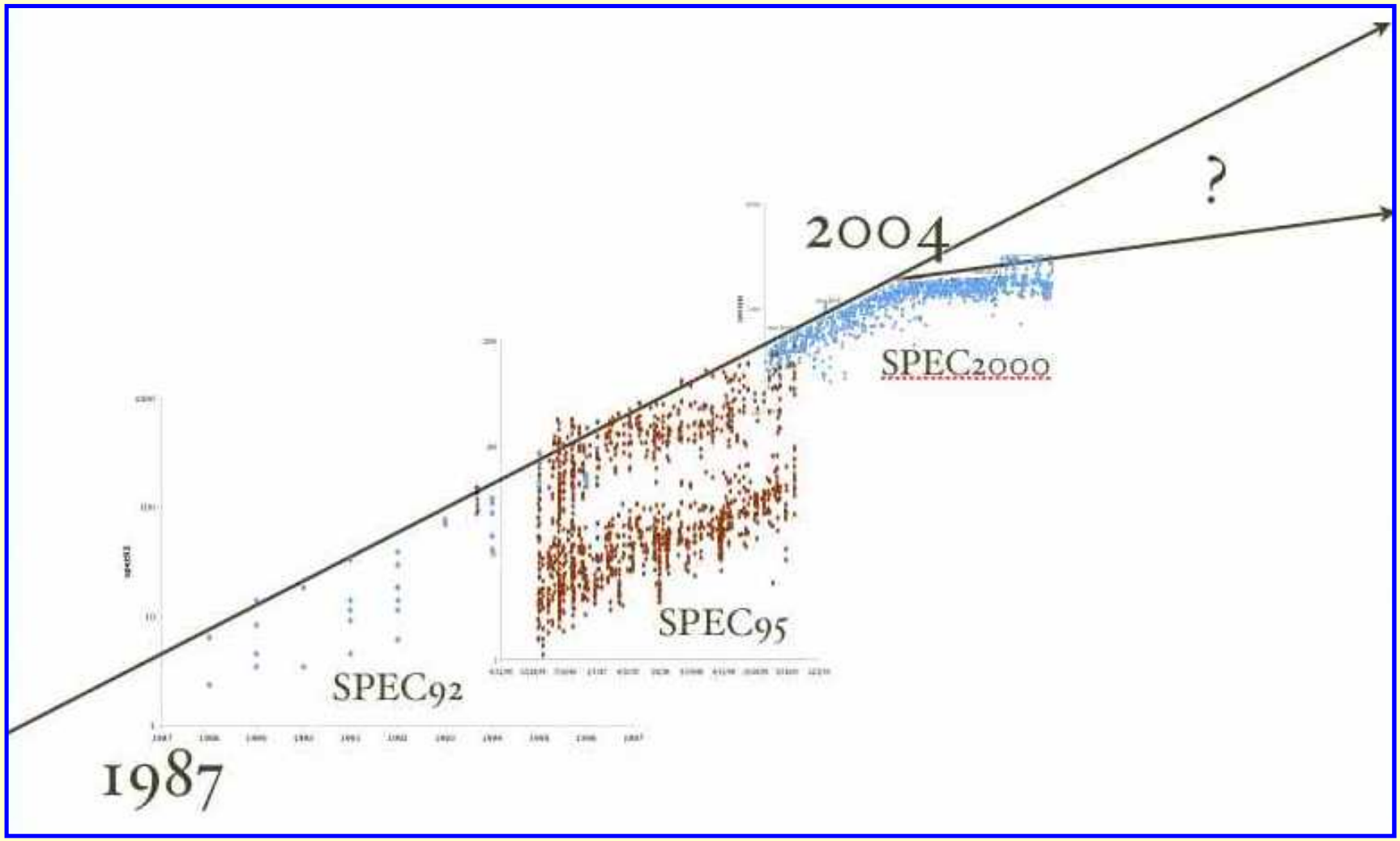
# THIS is the Problem!

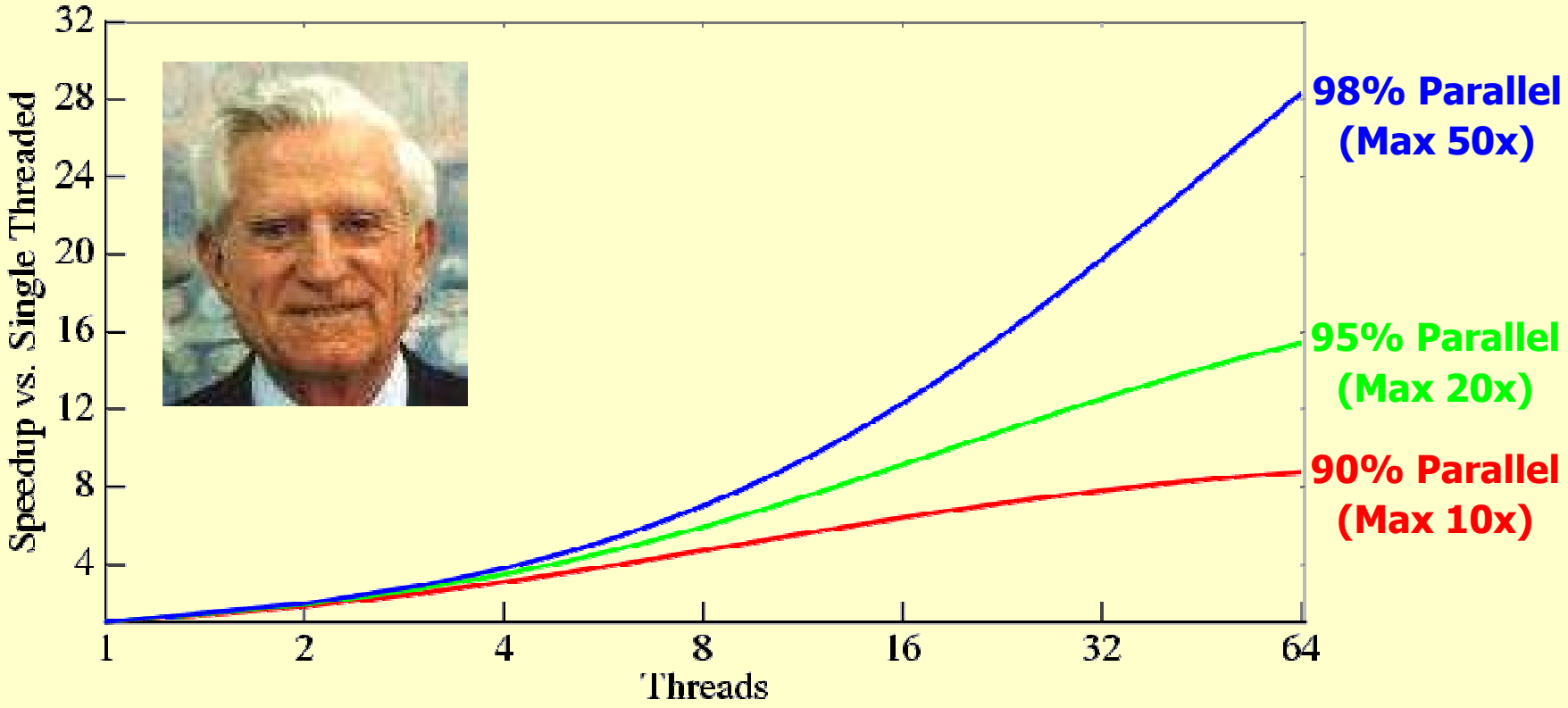



Graph Courtesy Mark Oskin

# Why New Multicore Languages Will Fail

1. Money is earned by relieving customer pain
2. Programmers adopt new programming models
3. Legacy code
4. The Market: $1,152 Billion in SW + IT Service vs. $138 Billion in HW
5. Parallel programming is more difficult
6. Parallel programming models have longevity issues

# Automatic Parallelization is Necessary




Programmers can't be expected to parallelize that last few percent

"Sequential Portion" – the part of a program that frustrated the programmer

# Automatic Parallelization is Impossible, Right?

Naysayer Arguments:

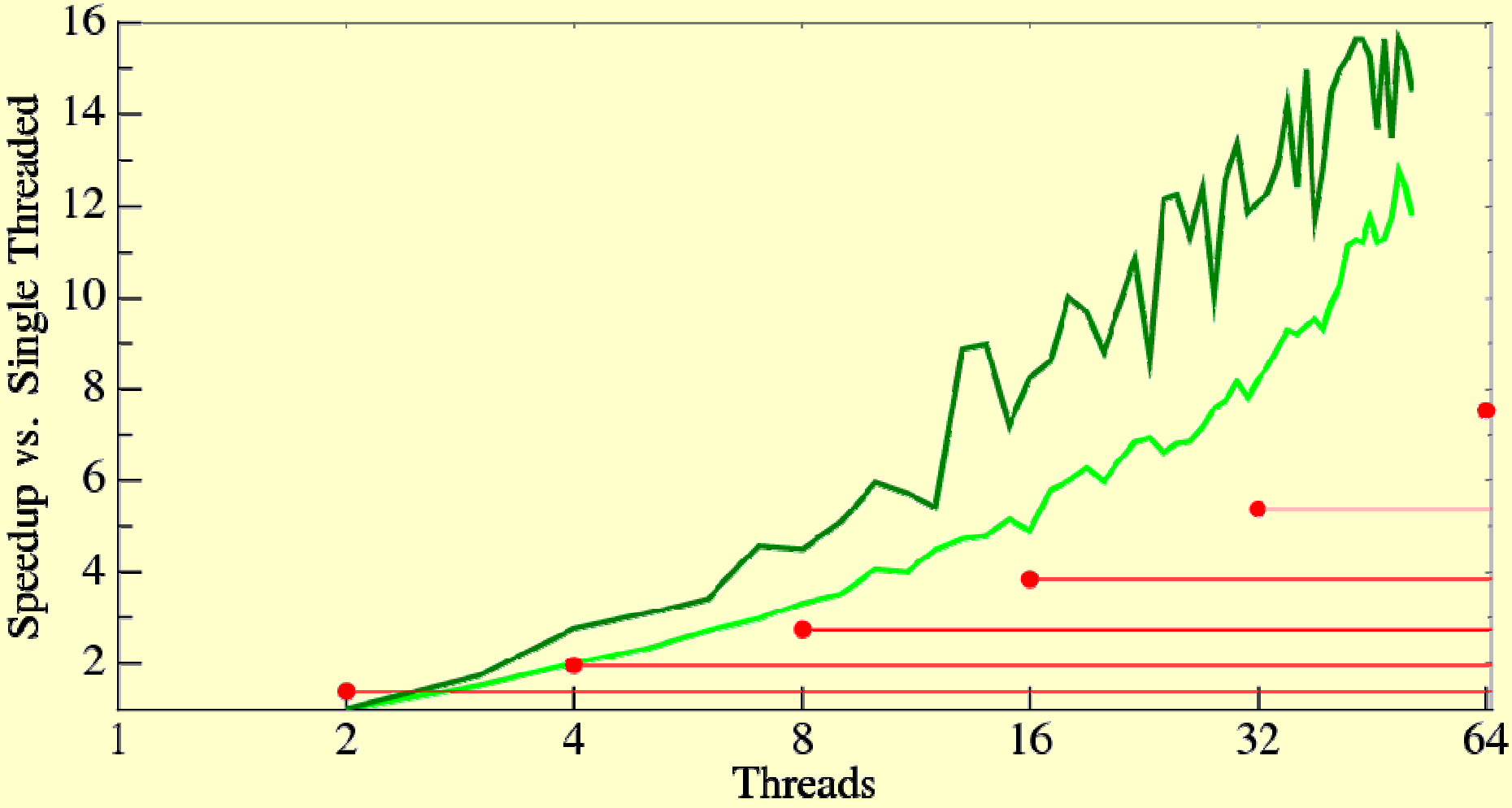
- Decades of automatic parallelization work a failure
- Programs have too many dependences
- Analysis not powerful enough

Reality:

- This is not the same problem: Multicore does not need to be multiprocessor on a chip!
- ILP research more relevant than old school automatic parallelization
- Automatic parallelization is a reality today.

# SPEC 2000: 197.parser

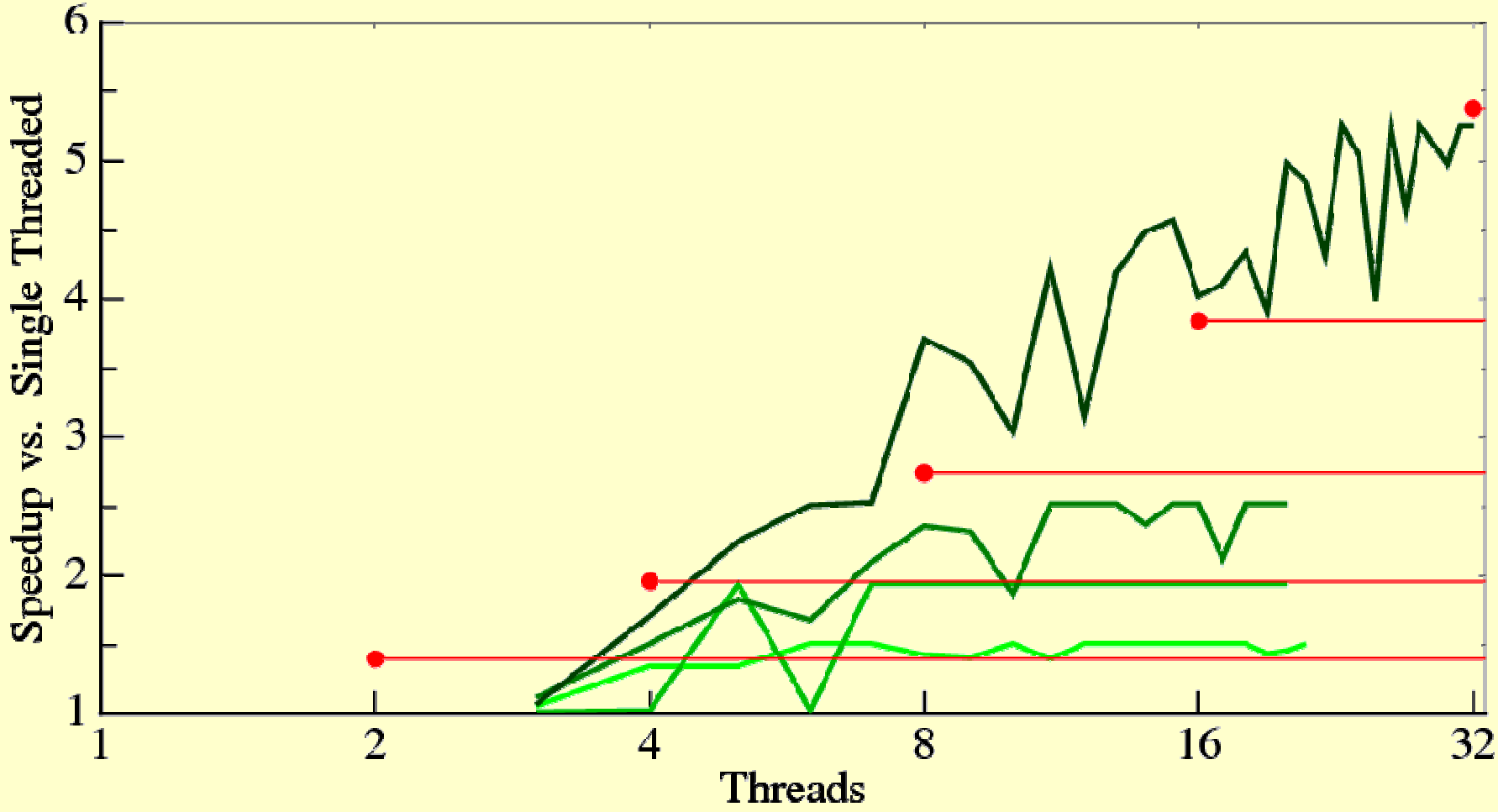
## Automatic Parallelization




Threads run on multicore model with Itanium 2 cores.

# SPEC 2006: 403.gcc

## Automatic Parallelization

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