


UNIVERSITEIT GENT

Exploiting Coarse-Grain Parallelism at Run-time

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HiPEAC COMPILATION ARCHITECTURE

Adaptive Compilation Meeting

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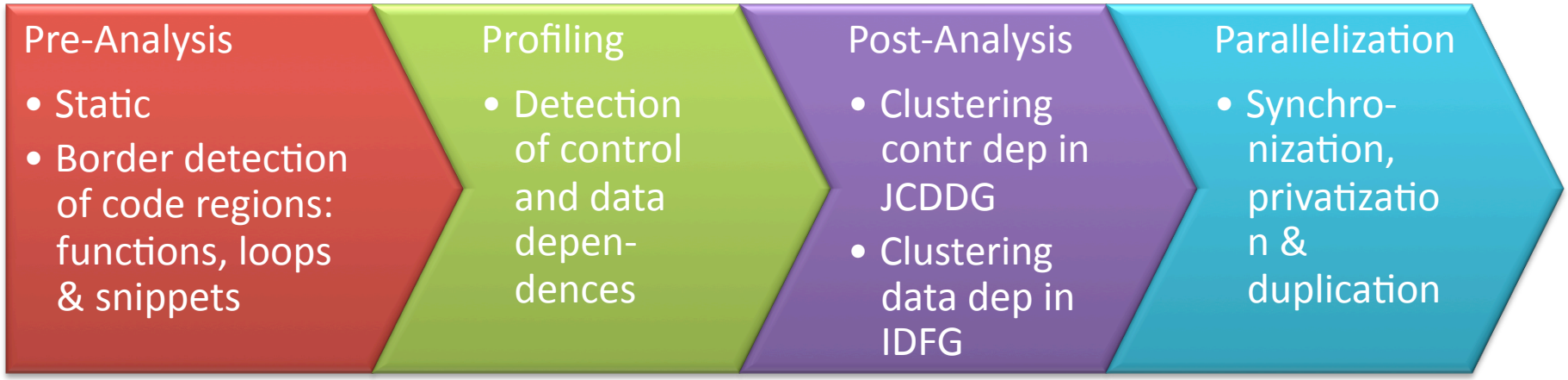
PARIS

A Dynamic Analysis Tool for Detecting Coarse-Grain Parallelism [1]



Characteristics

- coarse-grain parallelism
- outermost toplevel loops
- extracting DO-ACROSS parallelism

[1] Sean Rul, Hans Vandierendonck and Koen De Bosschere
Detecting the Existence of Coarse-Grain Parallelism in General-Purpose Programs
Proceedings of the First Workshop on Programmability Issues for Multi-Core Computers, MULTIPROG-1, pp. 12 (2008)

Feedback to Compiler

- Currently: Providing feedback to programmer
  - Pro: human insight
  - Con: error-prone and labor intensive
- Next step: Providing feedback to compiler
  - Pro: fast
  - Con: no real understanding

Run-time Verification of Speculative Parallelization

- Combining static and dynamic analysis
  - Determine true dependences statically in advance
  - Lightweight profiling for obscure dependences
- Enables confident TLS in software
  - No special hardware support required
  - Recovery procedure should be a rarity