

# Optimistic Software Parallelization

## HEAP FP7 project

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Multi-processor CPUs and systems are becoming ubiquitous, but their incredible performance can be fully exploited only by programs aware of architecture parallelism.

However, writing parallel programs has traditionally been considered a difficult task, even when parallelism is taken into account from the beginning. Moreover, there is a massive amount of legacy sequential code in urgent need of parallelization to significantly increase its performance on modern multi-processor CPUs and systems.

The HEAP project addresses these challenges directly. An innovative toolset was developed to help the software developers to profile and parallelize any existing sequential implementations by exploiting top-level pipeline-style parallelism.

In the DATE 2012 University Booth we will demonstrate the innovative toolflow that eases the parallelisation of sequential C-code based on a runtime analysis of the dataflow.

The figure illustrates a snapshot of the HEAP GUI representing how the statements of the sequential source code generate and use the data items.

The resulting parallelized code uses the Kahn Process network model of computation to ensure deterministic behavior for arbitrary parallel process execution times, without data races.

