

## Master Thesis Project Proposal (30hp):

### Performance visualization for distributed stream processing pipelines with data-parallel tasks

Recently, the high-level parallel programming framework SkePU developed at Linköping University has been extended with interactive performance visualization. This feature consists of a tracing extension in the C++ framework, combined with a visualizer application. The visualizer utilizes a client-server structure: a Python-based web server reads trace files and converts them into graph data, while a HTML/CSS/Javascript front-end provides the interactive user interface.

**Task** This project will extend the existing SkeVU visualizer with support for tracing and visualization of SkePU-Streaming pipeline applications. Technical challenges expected relate to data collection and merging of separate node-specific trace files, in particular involving synchronization of node-specific clocks and timestamps.

The project will also involve creative design choices pertaining to how a streaming pipeline should best be visualized in an interactive application, and how performance metrics and related properties can be exposed in intuitive and efficient ways, as well as implementing this interface in a web-based programming environment.

**Prerequisites** TDDD56 Multicore and GPU Programming (mandatory), Advanced Programming in C++ (recommended). Experience with web programming (recommended). Experience using Linux and related tools.

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