
Co-optimizing Dataflow Graphs and Actors with MLIR

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Résumé

Dataflow programming is considered a good solution for the implementation of parallel signal processing applications. However, the strict separation between kernel and coordination codes limits the variety of possible optimizations and the compatibility with state-of-the-art compiler frameworks. We present a prototype static dataflow compiler, built with the LLVM MLIR framework, that overcomes these limitations and enables a previously impossible combination of optimization strategies that leverages information from the dataflow topology. Initial results show 30% wall time improvement and 53% memory usage improvement on a video processing workload.

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