

Abstract Submission on SAPLING

(Confidential)

# Static Translation of Stream Programs

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# Abstract

Stream processing is an evolving computer programming paradigm that simplifies parallel programming by delivering a computation by a set of streams and a set of actors. A stream is a channel that carries data elements from a source to a destination. An actor reads elements from incoming channels, processes them, and generates output elements on output channels.

In this work, we consider a static stream model that has constant input and output bandwidths for each actor. We study a mathematical model and algorithms to resolve bottlenecks in stream programs that map actors of stream programs to processors in a parallel systems, and compute a schedule for each processor. The goal of the translation of a stream program to a parallel system is to statically optimize the throughput of the stream program. We formulate the scheduling and assignment of actors to processors as an Integer Linear Program (ILP). We compare ILP solution with an approximation algorithm.