Abstract

Queue Compiler Development

Arquimedes Canedo,[†1,†2] Ben Abderazek[†1,†2]
and Masahiro Sowa[†1,†2]

Queue processors are a viable alternative for high performance embedded computing. We present the development of a compiler for a queue-based processor. Instructions of a queue processor implicitly reference their operands making the programs free of false dependencies. Compiling for a queue machine differs from traditional compilation methods for register machines. The queue compiler is responsible of calculating instructions relative offset values to access their operands, and scheduling the program in level-order manner to expose natural parallelism. This presentation describes the phases and data structures used in the queue compiler to compile C programs into assembly code for the QueueCore, an embedded queue processor. Experimental results demonstrate that our compiler produces good code in terms of parallelism and code size when compared to code produced by a traditional compiler for a RISC processor.

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†1 Information Processing Society of Japan Special Interest Group on Programming
†2 Graduate School of Information Systems, University of Electro-Communications