MLRTEMS: Embedded Standard-ML

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1 Summary

Functional programming is often ignored in embedded and real-time systems because of its perceived runtime overhead. Our project aims to provide a bridge between the MLton optimizing Standard-ML compiler, and the RTEMS real-time systems executive.

2 Project Overview

Standard-ML is a well-documented and standardized functional programming language with a strong, inferred Hindley-Milner type system. We argue that embedded systems could stand to benefit immensely from functional constructs such as immutable data structures and pattern matching provided in languages like Standard-ML. Embedded systems also require strict runtime performance guarantees, and Standard-ML provides mutable references and arrays to accommodate times when one would want to sacrifice purity for speed.

MLton translates Standard-ML code to optimized C and RTEMS is provided as a series of C libraries that are conditionally compiled to meet the needs of the system. MLton's C foreign function interface