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Fast Evaluation in HOL

An introduction to cv_transLib

Magnus Myreen

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Before cv_compute

EVAL

Candle Paper 1

Candle: A Verified Implementation of HOL Light

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Abstract

This paper presents a fully verified interactive theorem prover for higher-order logic, more specifically: a fully verified clone of HOL Light. Our verification proof of this new system results in an end-to-end correctness theorem that guarantees the soundness of the entire system down to the machine code that executes at runtime. Our theorem states that every exported fact produced by this machine-code program is valid in higher-order logic. Our implementation consists of a read-eval-print loop (REPL) that executes the CakeML compiler internally. Throughout this work, we have strived to make the

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Candle Paper 2

Fast, Verified Computation for Candle

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Abstract

This paper describes how we have added an efficient function for computation to the kernel of the Candle interactive theorem prover. Candle is a CakeML port of HOL Light which we have, in prior work, proved sound w.r.t. the inference rules of the higher-order logic. This paper extends the original implementation and soundness proof with a new kernel function for fast computation. Experiments show that the new computation function is able to speed up certain evaluation proofs by several orders of magnitude.

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