

Accurate Quality Estimation of Approximate Accelerators via Advanced ML Methods

Approximate accelerator synthesis through search is an iterative process that generates and validates new approximate instances of hardware accelerators. Among the various steps, validation or quality estimation by determining the accelerator's error, is the most time-consuming. This validation can be performed using formal verification, simulation, or analytical methods—listed here in order of decreasing runtime cost.

Analytical methods, such as machine learning-based regression and classification, offer the fastest inference times. However, they come with trade-offs, including significant training time and the prediction inaccuracies.

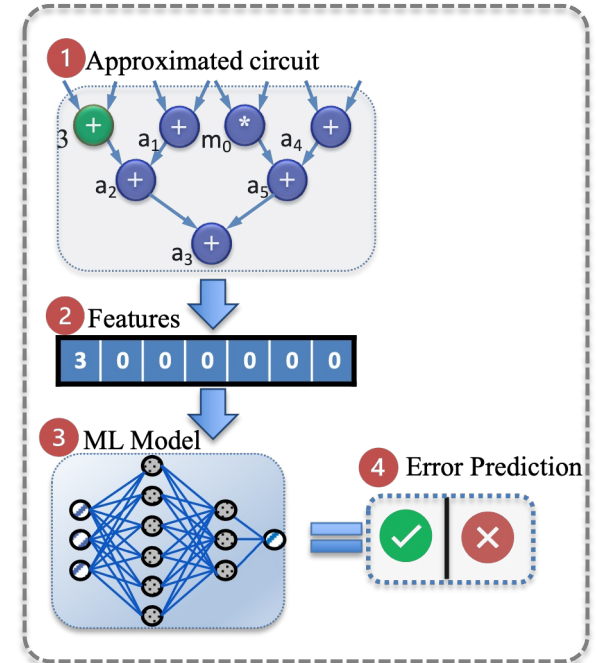
This thesis aims to investigate advanced machine learning techniques to enhance the accuracy and reliability of analytical quality estimation for approximate accelerator designs.

Project Scope:

1. Analyze existing quality estimation method to identify their limitations
2. Explore advanced machine learning methods for improved quality estimation
3. Evaluate and compare the performance and accuracy of these methods

Prerequisites:

Verilog, Python, Good grip of ML concepts, Knowledge of SystemC would be a plus



Interested?

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