PADERBORN UNIVERSITY

# Open Master's Thesis Project

Computer Science Department
Computer Engineering Group
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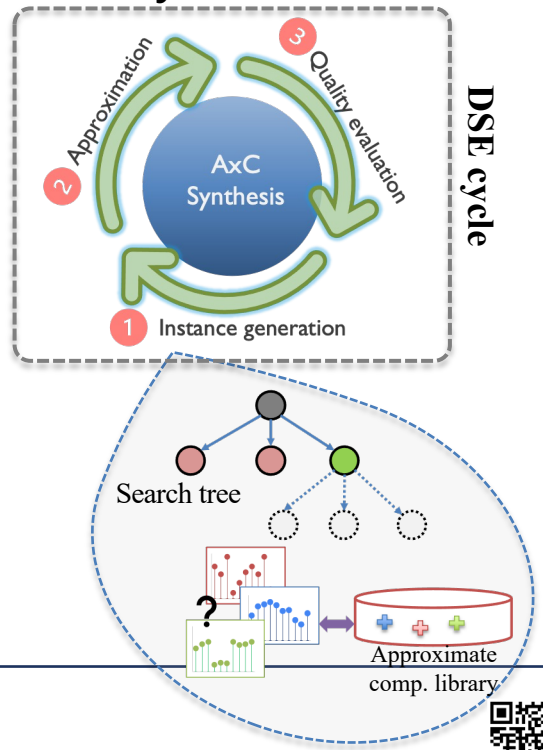
## Clustering of Approximate Library Components for Efficient Search-based Synthesis

A widely used method for obtaining approximate accelerators is search-based optimization, which faces challenges navigating a large design space. This complexity stems from the increasing number of components and their multiple approximation options. Consequently, the search tree's branching factor grows, making it harder to find feasible designs efficiently. A promising way to address this is by reducing the branching factor through restructuring approximations at each search level. This involves grouping similar approximations and selecting a representative from each group to prune the search space.

This thesis aims to leverage statistical error analysis to cluster library approximate components into meaningful groups and use representatives during the search. The approach seeks to reduce overall search effort while preserving design quality.




**Project Scope:**

1. Analyze existing search-based DSE tool
2. Develop statistical error-based clustering of approximations
3. Implement and evaluate search space reduction method

**Prerequisites:** Verilog, SystemC, Python, Knowledge of probabilistic error analysis and/or statistical concepts is a plus

**Interested?**

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