

# FMitF: Track I: DeepSmith: Scheduling with Quality Guarantees for Efficient DNN Model Execution

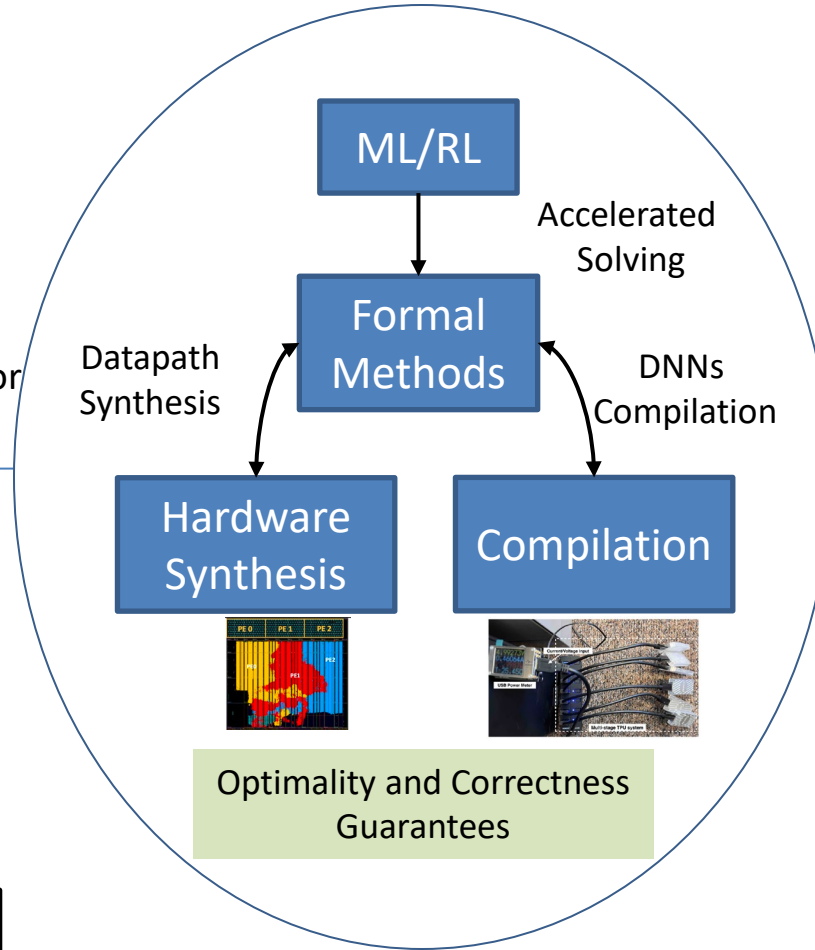


## Challenge:

- Formal methods for generating optimal or near-optimal hardware compilation solutions
- ML-based formal reasoning and solving for optimization

## Solution:

- Equality saturation graphs in synthesis
- Incremental formal reasoning with RL
- GPU acceleration



## Scientific Impact:

- Demonstrated potential optimality guaranteed domain-specific compilation and synthesis
- Significant improvements over commercial SOTA and successful technology transfer

## Broader Impact and Broader Participation:

- Raise the interests in formal methods for hardware/ML for FMs
- University Engineering Day/Curriculum. REU student joined MIT EECS PhD program.
- Two technology transfers; Best Paper DAC'23.

NSF 2349461/2019306. Cunxi Yu  
(University of Maryland - College Park)  
Zhiru Zhang (Cornell University)

