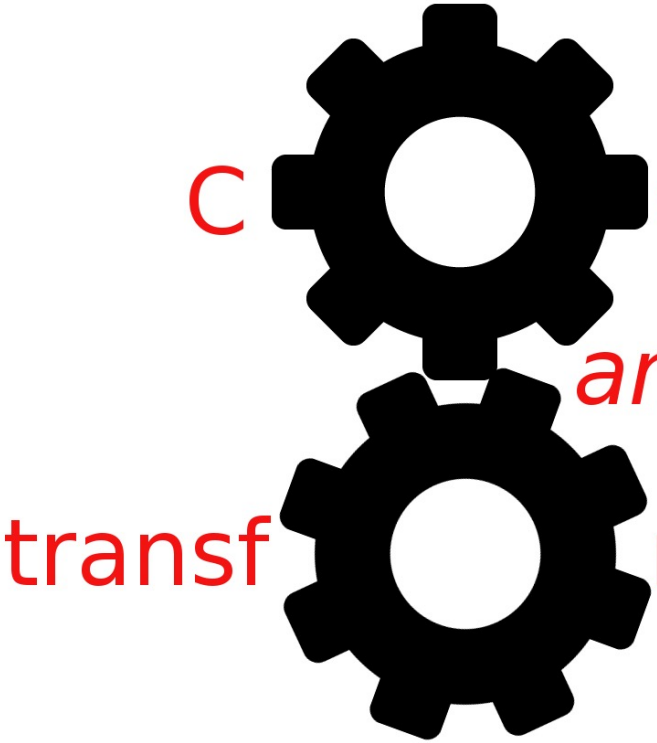

Research on CAT

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From our class to the state-of-the-art

- Improvements
- Value-based CAT
- Empirical model-based CAT
- Specialized CAT
- Better compiler structures

Improvements of our algorithms

- Alias analysis with
  - higher accuracy
  - Faster
  - Less memory consumption
- Better heuristics for
  - When to inline
  - When to unroll/peel/etc…
  - When to apply transformation X
- Better inter-procedural CAT
  - Better summary nodes
  - Better contexts

From our class to the state-of-the-art

- Improvements

- Value-based CAT

- Empirical model-based CAT

- Specialized CAT

- Better compiler structures

Value-based CAT

- Static value range CAT
- Profile-guided CAT
  - Use training inputs
- Dynamic CAT

From our class to the state-of-the-art

- Improvements
- Value-based CAT
- Empirical model-based CAT
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Empirical model-based CAT

- Autotuner
  - Typically: heuristic drives the CATs
  - Instead: use ML-based techniques to generate the model that drives the CATs
- Superoptimizers

From our class to the state-of-the-art

- Improvements
- Value-based CAT
- Empirical model-based CAT
- Specialized CAT
- Better compiler structures

Specialized CAT

- Domain-specific CAT
- Hardware-specific CAT
  - Parallelism extractions
- Programming language-specific CAT
- Hardware-software co-designed CAT

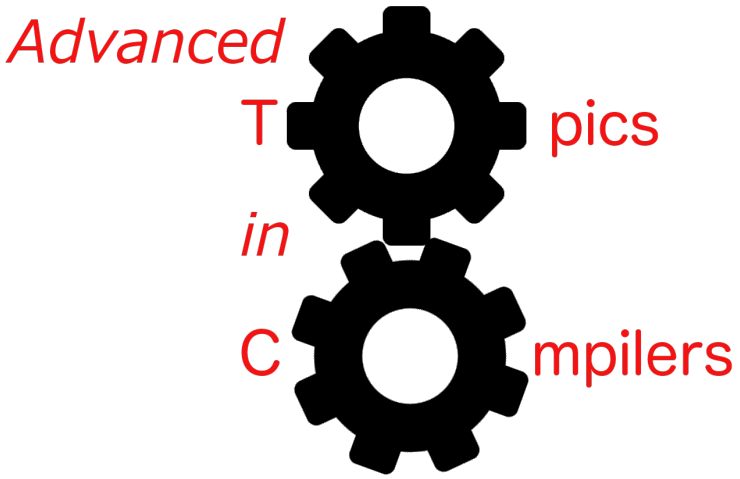
From our class to the state-of-the-art

- Improvements
- Value-based CAT
- Empirical model-based CAT
- Specialized CAT
- Better compiler structures

Better compiler structures

- Better compiler constructions
  - LTO
  - Better PassManager
- Certifying compilers
- Better IRs

Are you interested?



Talk to me (independent studies/projects)