Sequential Reasoning for Optimizing Compilers Under Weak Memory Concurrency

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Introduction

- Performing/designing thread-local optimizations in a concurrent context would require understanding the underlying memory consistency model.
- Often, these models are complex, as they are weak consistency based.
- Thus, it becomes difficult to design optimizations which are safe.
- Most optimizations that are performed on concurrent programs mainly involve reordering or eliminating non-atomics.
- Is there perhaps, then a simple sequential semantics that an optimization designer can rely on?

Main Idea