



EMSOFT '19, October 14 2019, NYC



Work-in-Progress:

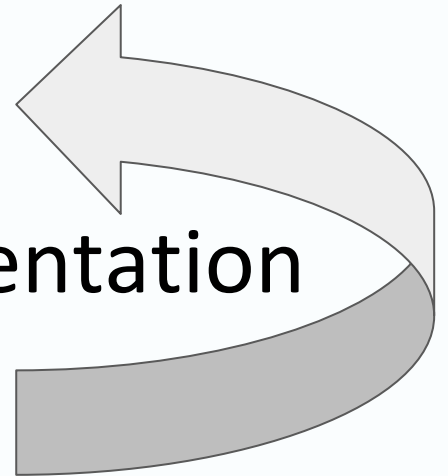
Programs with Iron-Clad Timing Guarantees

Marten Lohstroh, Martin Schoeberl
Mathieu Jan, Edward Wang, Edward A. Lee



Satisfying Timing Requirements Today

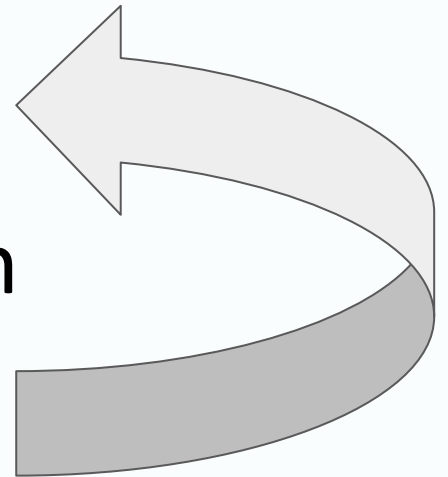
1. Build an implementation
2. Build a model of that implementation
3. Verify/validate the model





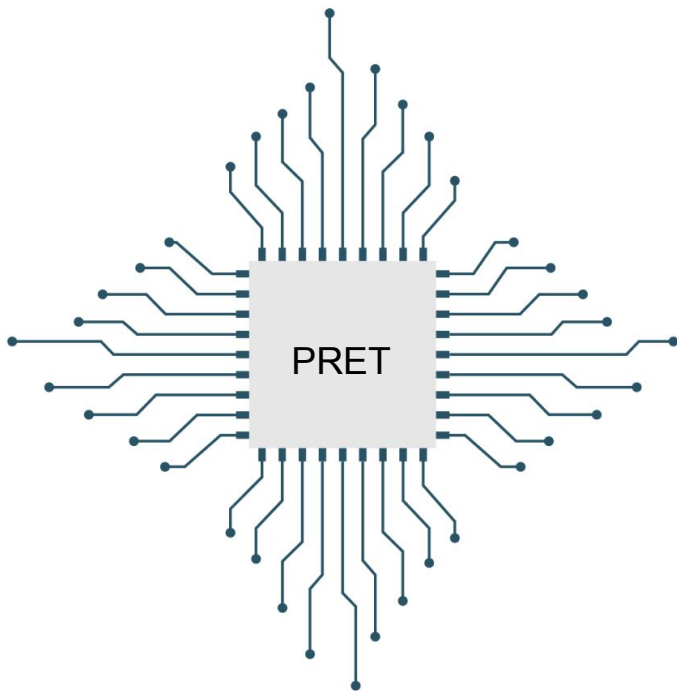
A Paradigm Shift

1. Specify desired behavior
2. Synthesize an implementation
3. Report if not feasible





The Missing Pieces



Precision-Timed Hardware



Precision-Timed Software



Precision-Timed Programming Model

Reactors

Model of Computation

- Timed
- Synchronous
- Deterministic
- Concurrent
- Event-driven

Establishes an unambiguous relationship between physical and logical time.

Lingua Franca

Coordination Language

- Polyglot
- Multi-core
- High-performance
- Low overhead
- Compiler + IDE

For specifying deterministic behaviors and imposing timing constraints.



<https://github.com/icyphy/lingua-franca>