

Embedded Systems Frontiers

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The Avionics Frontier is Embedded Systems Frontier



Latest Commercial Fly-By-Wire Aircraft:

- 550 passengers on two flight decks
- 150 tons payload
- 10410km range

The Space Frontier is Embedded Systems Frontier



The X Prize: \$10million for the first who:

- Privately finances, builds & launches a spaceship, able to carry 3 people to 100km
- Returns safely to Earth
- Repeats the launch with the same ship within 2 weeks

The Materials Frontier is Embedded Systems Frontier



Active Aeroelastic Wing:

- 10000-100000 smart sensor and actuator nodes
- time-triggered communication?

The Processor Frontier is Embedded Systems Frontier



XScale Core:

- 400MHz
- low power
- wireless support

The Network Frontier is Embedded Systems Frontier

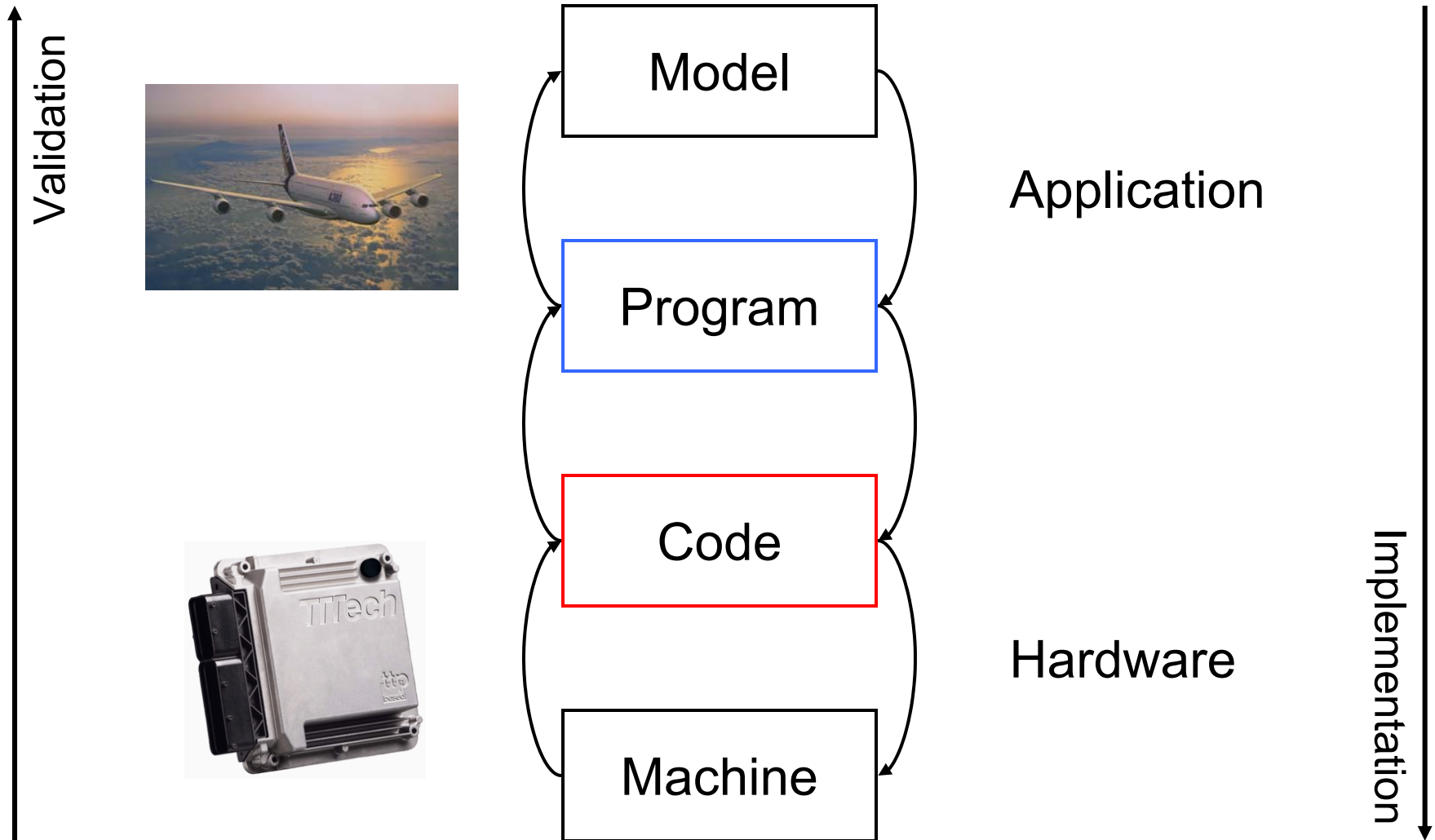


TTP X-By-Wire Node:

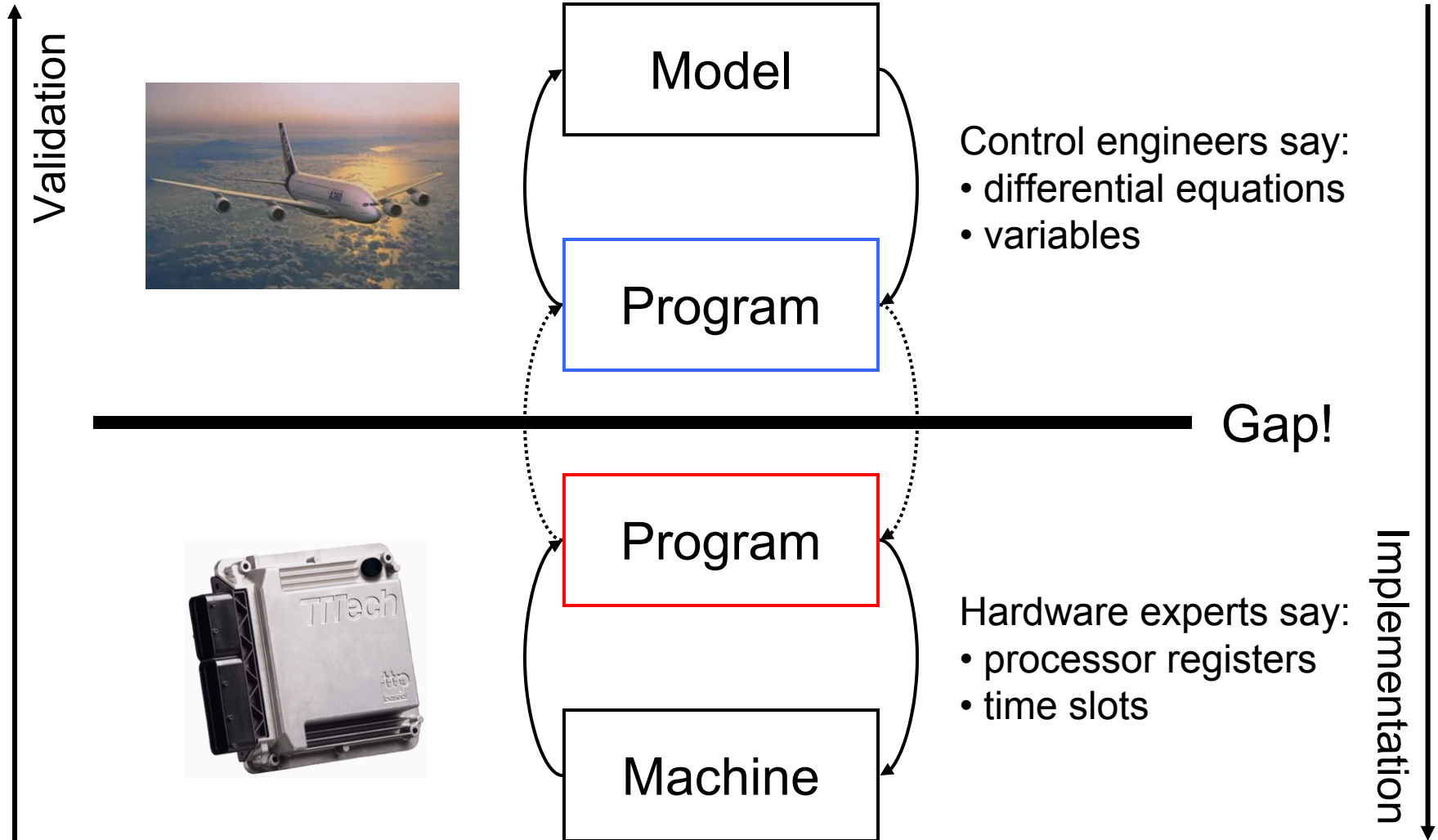
- MPC555 Processor
- TTP-C2 Controller for up to 5Mbit/s

The Software Frontier is Embedded Systems Frontier

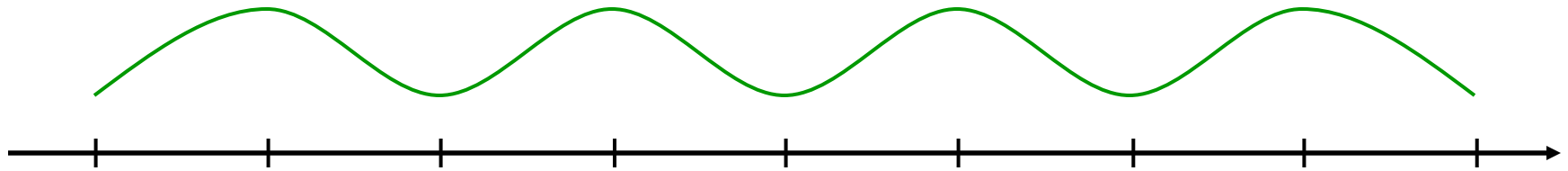
Embedded Software Development



Technical and Social Gap



Real Time vs. Soft Time

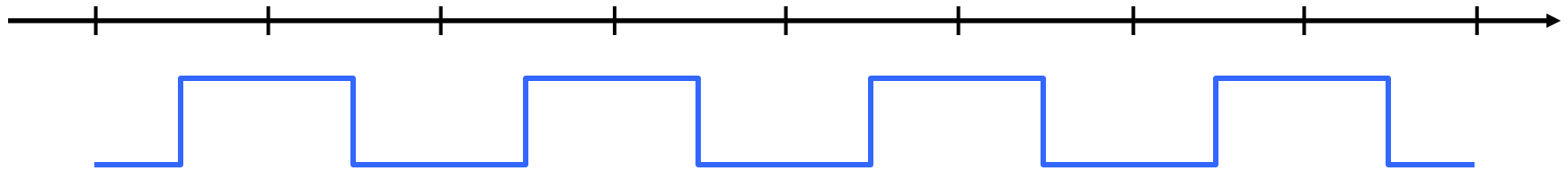


Environment Processes

Real Time



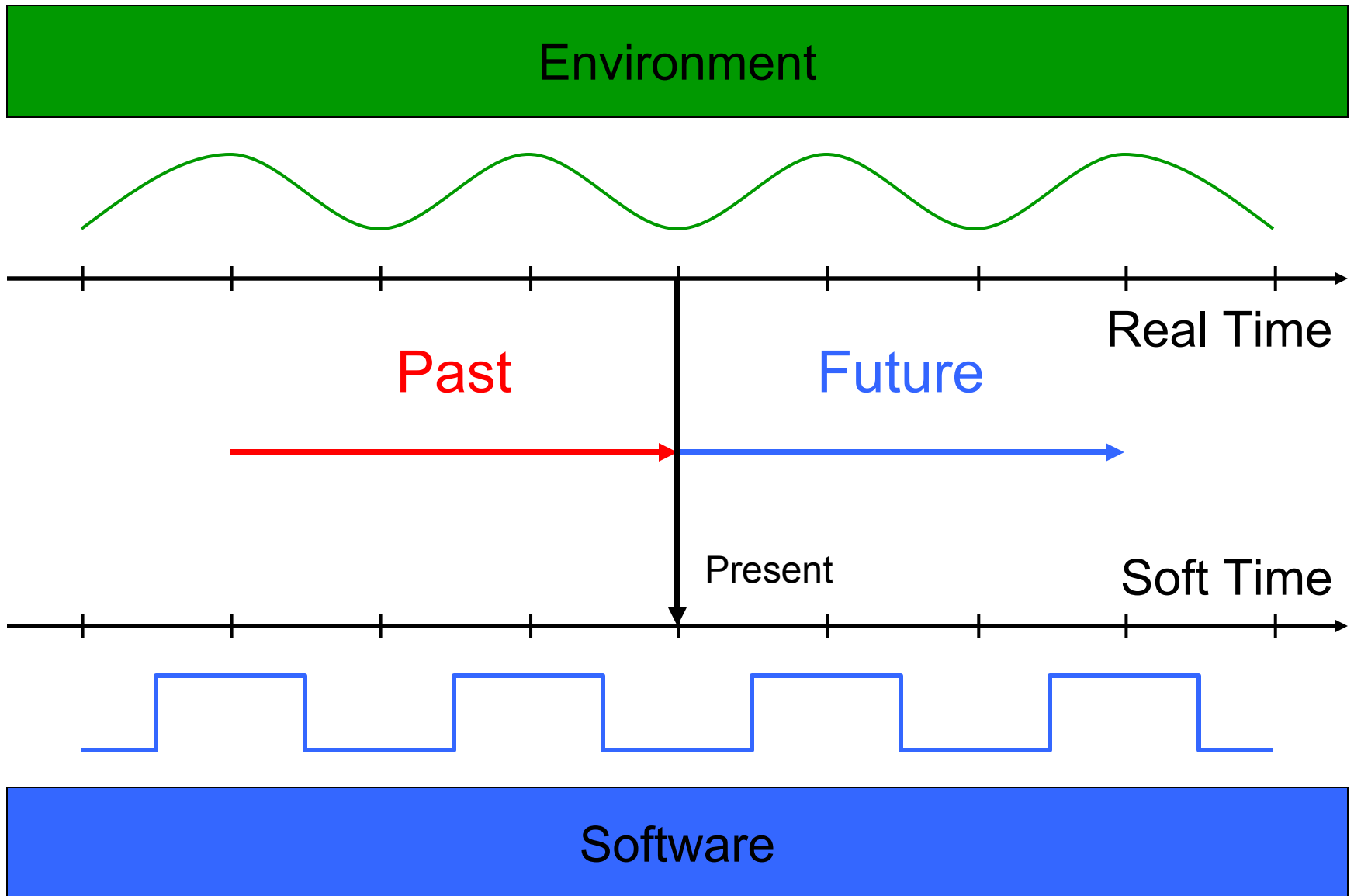
Software Processes



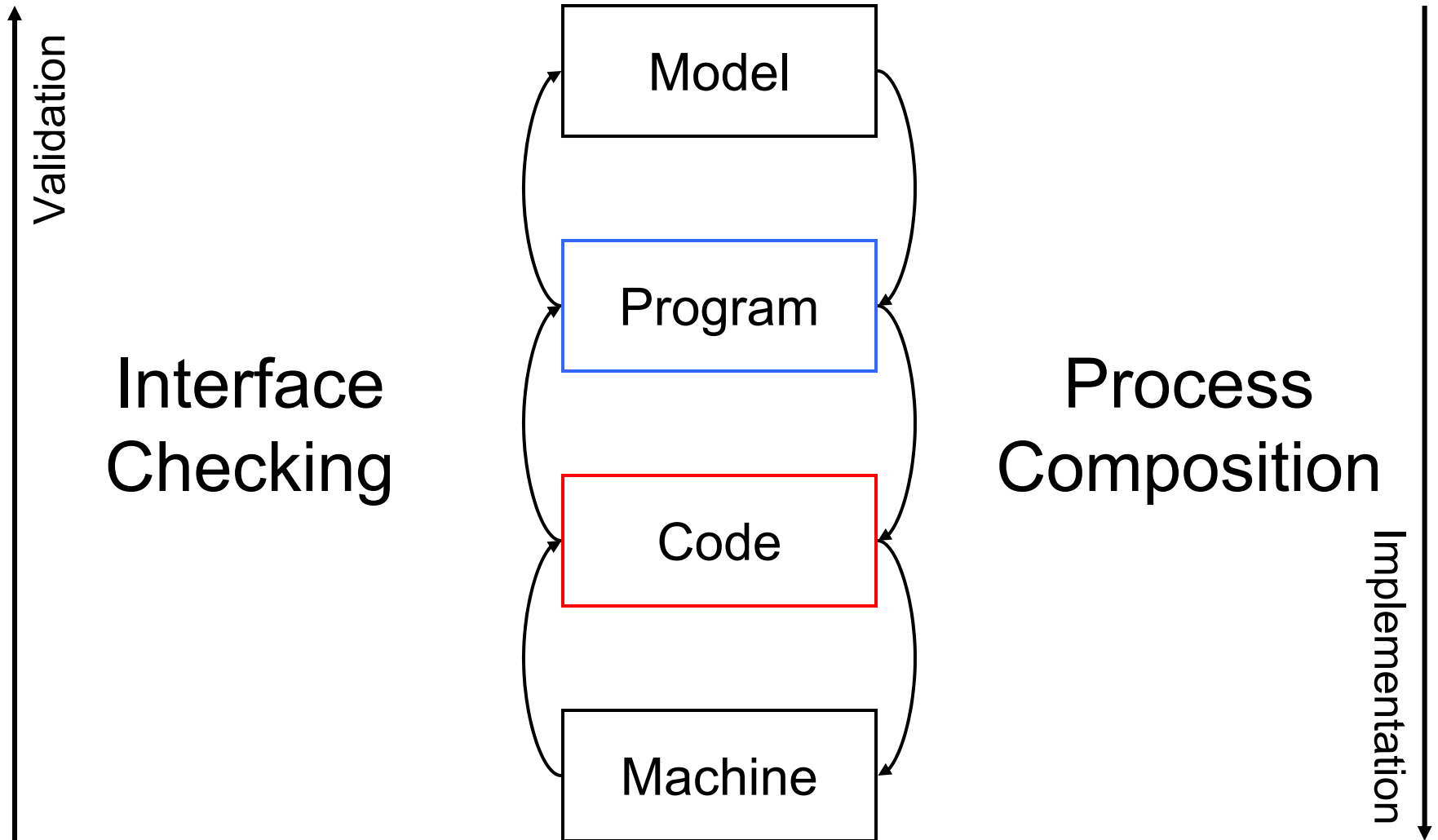
Soft Time



Sequential Programs vs. Parallel Processes

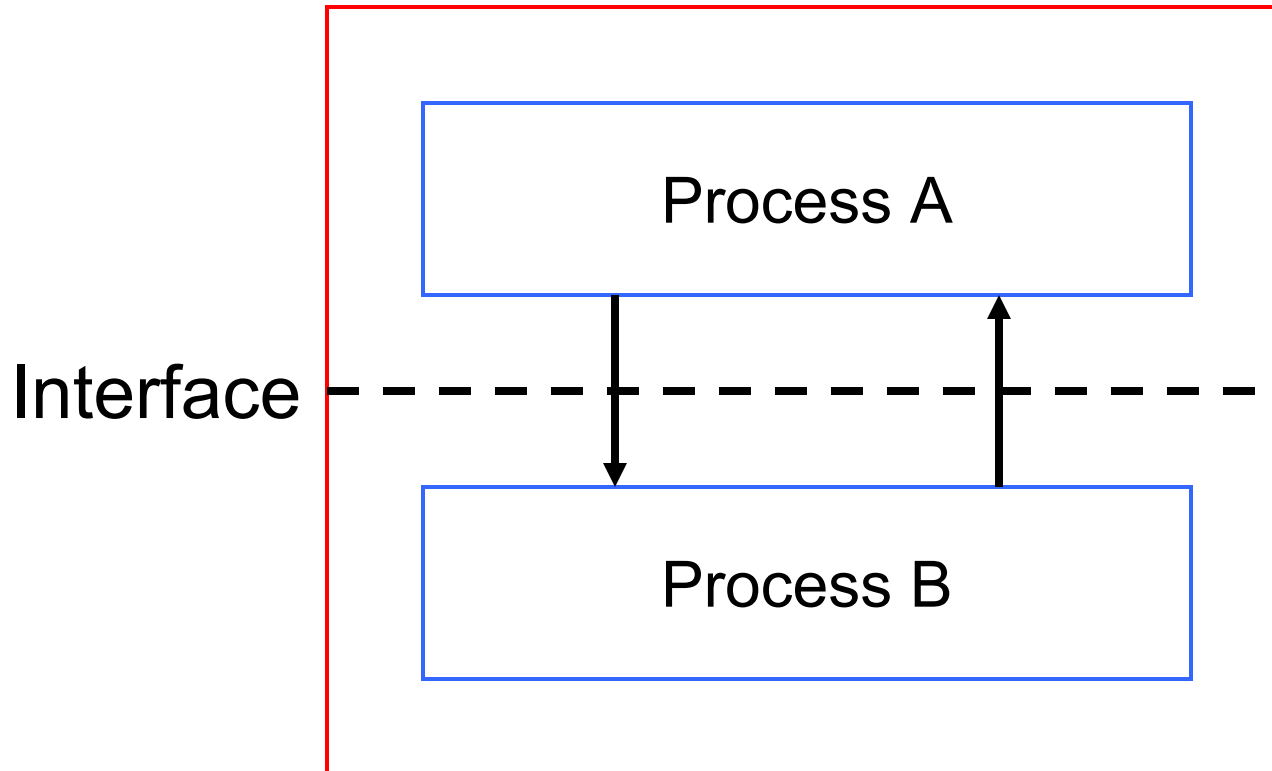


Concurrency Model



Composition and Interface

Composition



- interface automata
- system types

- synchronous computation
- reactive programming

Discussion

