



## CPS: Medium: Resource-Aware Hierarchical Runtime Verification for Mixed-Abstraction-Level Systems of Systems

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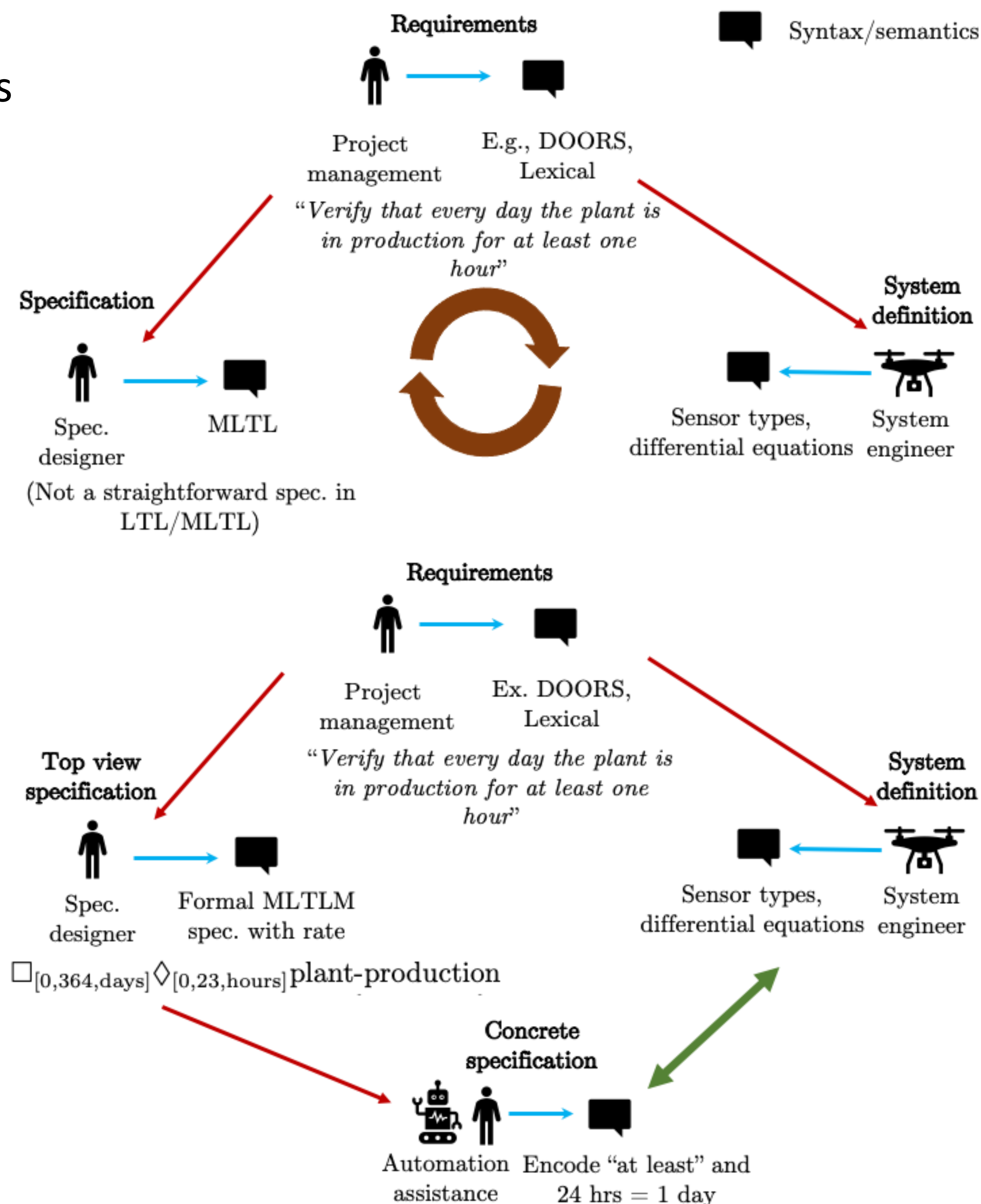
### Challenge:

Cyber-physical systems-of-systems require a specification language that allows reasoning over signals of different types (e.g., different time granularities or levels of abstraction)

### Solution:

Introduced MLTL Multi-type (MLTLM), an extension of MLTL that

- includes type conversions between different types in one formula
- allows for changing type conversions
- cleanly separates type conversions from logic



### Scientific Impact:

- Formalize reasoning over signals of multiple types
- Simplify workflow for developing CPS specifications

### Broader Impact:

- An open-source implementation of a direct encoding of MLTLM for runtime verification
- Involves 4 PhD students

