# CPS – Breakthrough: Development of Novel Architectures for Control and Diagnosis of Safety-Critical Complex Cyber-Physical Systems

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# Description

- Scalability of formal methods for synthesis of provably-correct controllers

- Development of abstraction techniques that lift CPS design problem to synthesis problem on discrete state system

- Combination of control and sensor activation

- Synthesis for resilience and adaptability

- Consideration of the distributed features of the system at synthesis step and at implementation step
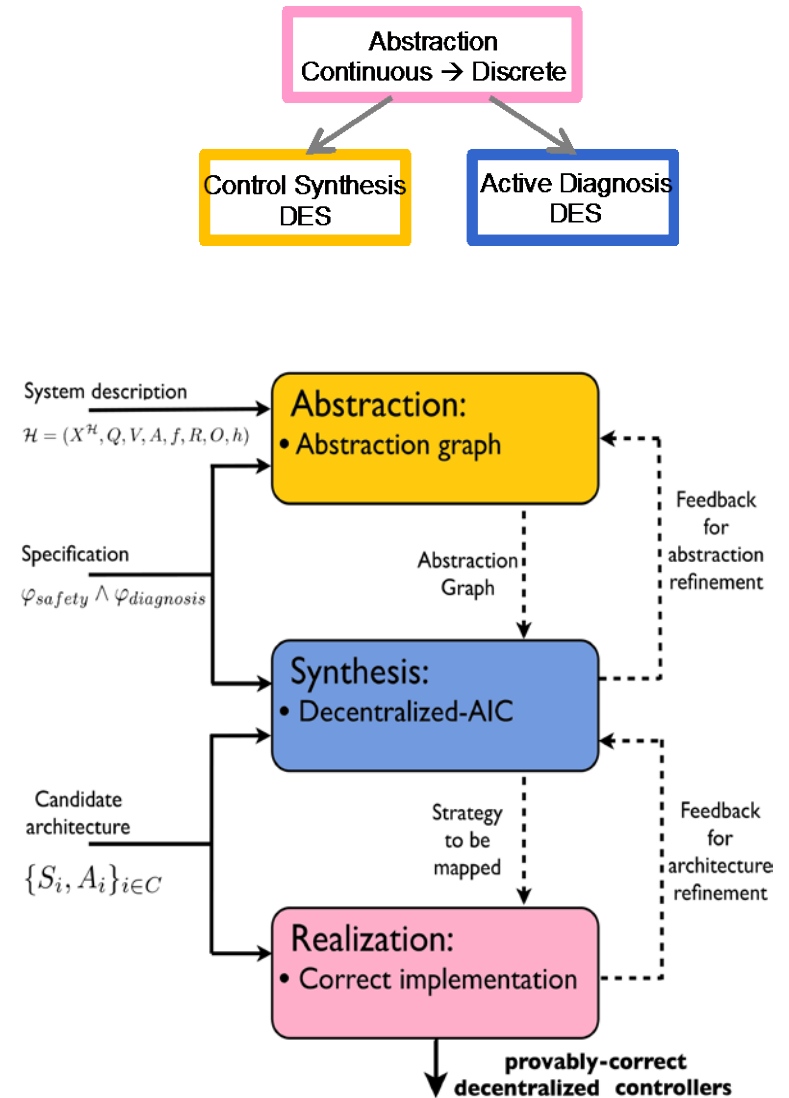
# Findings

## Discrete Synthesis

- Novel discrete synthesis methodology based on game structures (AES, MPO)
- Uniform approach for control and sensor activation
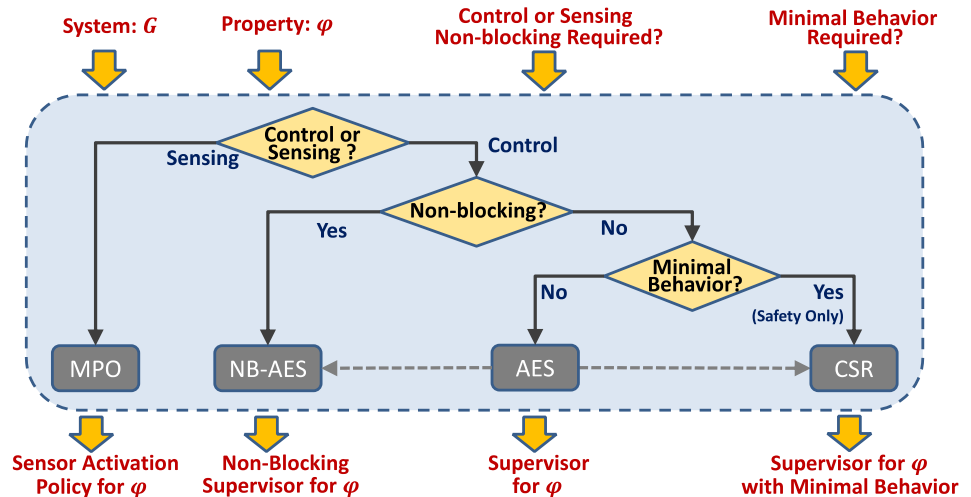


## Abstraction-based Synthesis

- Massively scalable synthesis technique for systems with symmetries with counting constraints
- Applications in multi-agent planning, thermostatically controlled load coordination