



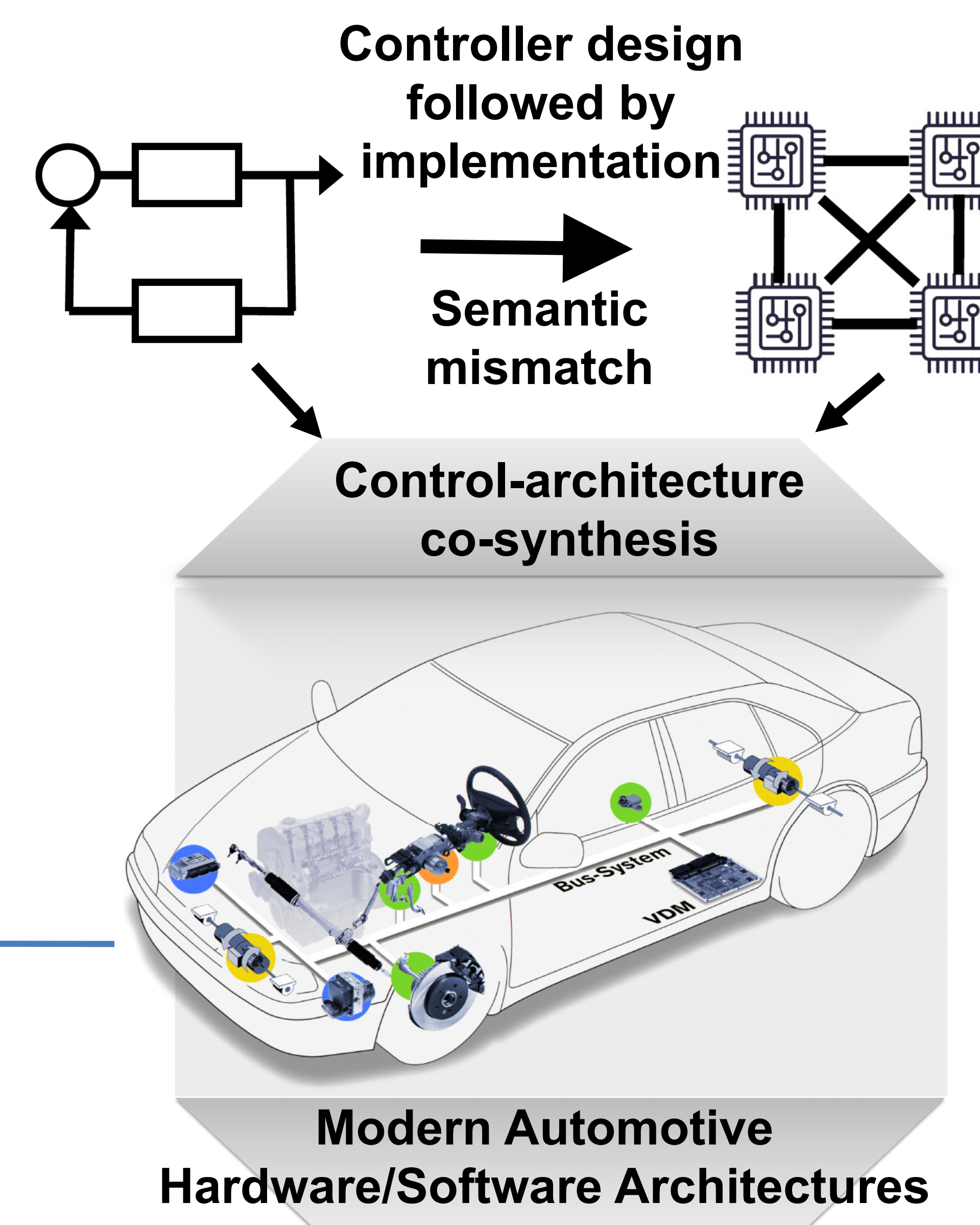
CPS: Medium: GOALI: Design Automation for Automotive Cyber-Physical Systems

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Challenge:

- Modern automotive architectures:
 - ✓ Distributed, heterogeneous
 - ✓ Complex sensor processing
- Consequence:
 - ✓ Many options for organizing computation & communication
 - ✓ Each option requires a different controller
 - ✓ Need for co-design & co-synthesis

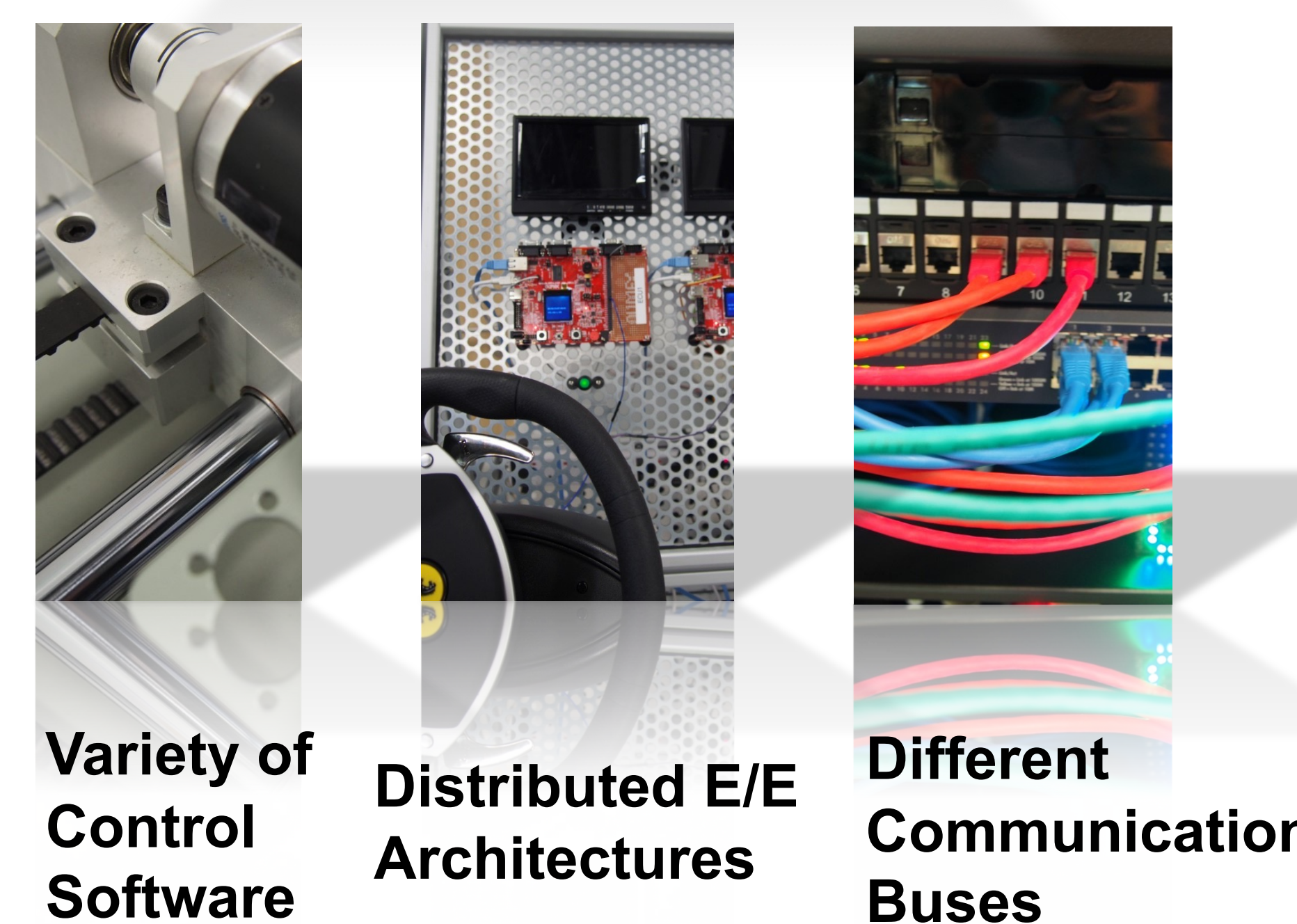


Scientific Impact:

- Solve challenge problems from GM
- Easier to design, debug and certify
 - ✓ Reduced testing & integration effort
- Easier to adopt new architectures
 - ✓ Because of automated synthesis
- Control/architecture co-synthesis
 - ✓ Relevant for robotics, industrial automation

Solution:

- Identify different implementation options
- Automated co-synthesis
 - ✓ Explore different implementation options & automatically synthesize controllers for them
- Develop a tool chain for co-synthesis



Broader Impact:

- Accelerate development, certification & adoption of autonomous systems
- Educate comp science students about control theory & systems engineering
- Bridge control theory and comp science & integrate controller design tools with electronics system design tools