



CPS:Medium:Collaborative Research:

## Certifiable reinforcement learning for cyber-physical systems

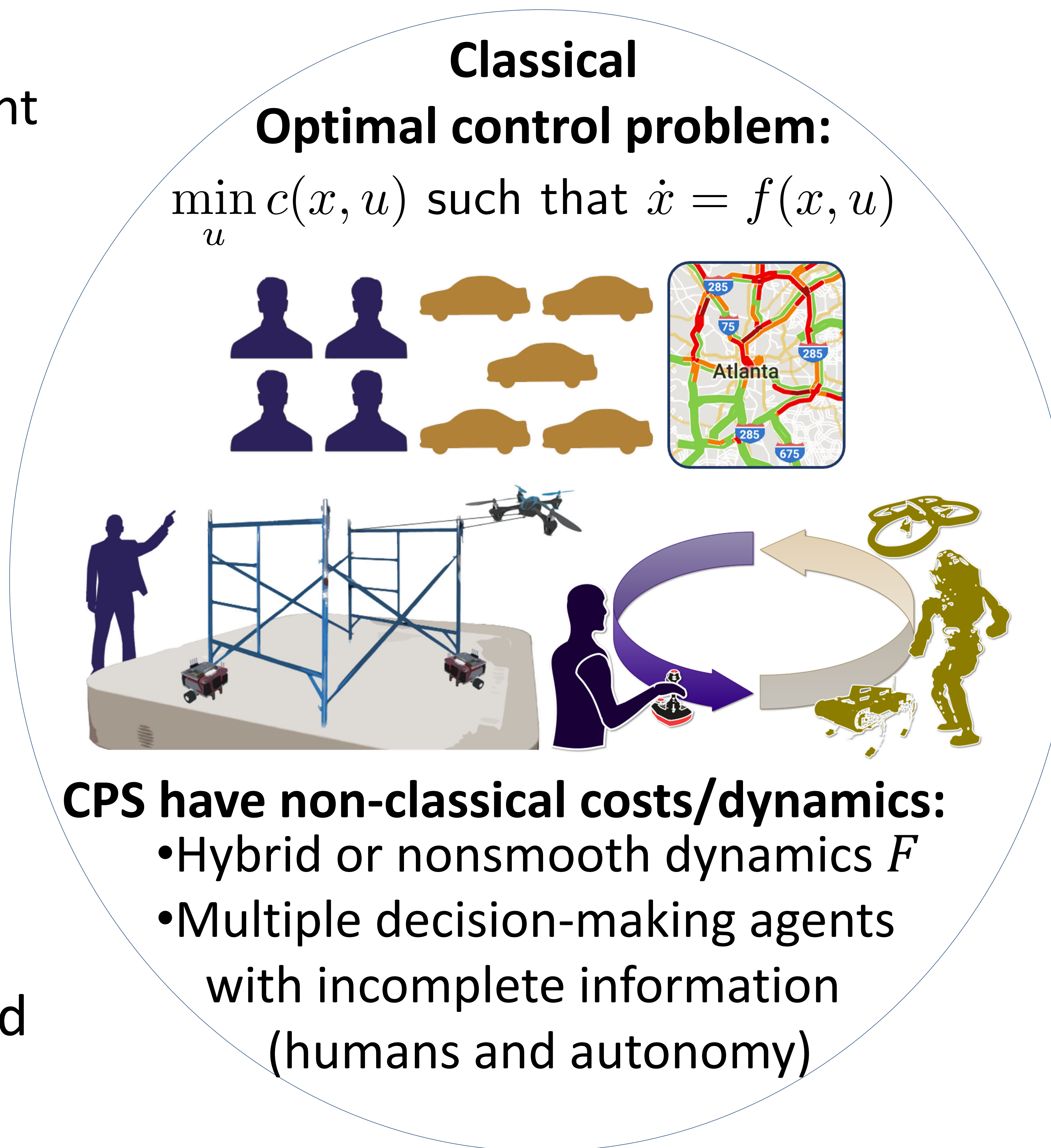
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### Challenges:

- Consistent credit assignment
- Metrics and measures for assessing convergence
- Scaling to high dimensions with value and policy gradients

### Solution:

- Extending contraction theory to hybrid systems
- Convergence guarantees for multi-agent systems
- Generalized value and policy gradients for hybrid and nonsmooth systems



### Scientific Impact:

- This project aims to lay the theoretical and computational foundation to certify reinforcement learning algorithms while leveraging data to control systems that interact with people across spatiotemporal scales.

### Broader Impact:

- This project allows reinforcement learning to be deployed in society with high confidence
- To facilitate a unified framework for certifying CPS, we are partnering with the UW Tech Policy Lab to co-organize a interdisciplinary workshop