Permissiveness for Strategy Adaptation

Ashwani Anand, Satya Prakash Nayak, and Anne-Kathrin Schmuck

MPI-SWS, Germany

Two Cyber-Physical Systems
- Two systems with own specifications
- Sharing the same workspace
- Independent policies might not exist

Game on Graphs
- Two players with own objectives
- Sharing the same game graph
- Independent strategies might not exist

Strategy Templates
- Gives choices to the system,
- Computable in polynomial time, if environment is helpful,
- Matches best known complexity, for adversarial environment.

Applications

Composition

Strategy Adaptation

Negotiation

Templates

Safety

Group liveness

Co-liveness

Assumption Templates
- Permissive for the environment,
- Computable in polynomial time, for any omega-regular objective
- Existing approaches require solving an NP-hard problem

\[ \phi_0 = \square \diamond d \]
\[ \phi_1 = \diamond \square \{c, d, e\} \]
\[ \phi_2 = \diamond \square \{c, d, f\} \]