Securing Mobile Cyber-Physical Systems Against Stealthy Attacks

Challenge:

How to secure Cyber-Physical Systems (e.g., a swarm of drones) against attacks?

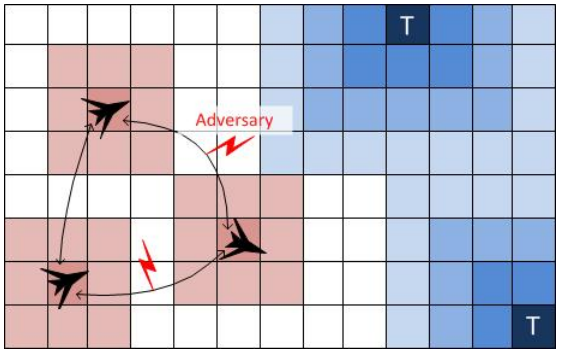
- Complex systems with real-time, energy and safety constraints
- Reliance on wireless technologies that are easy to jam

Solution:

- Identify stealthy attacks as solutions to large Markov Decision Process Problems (MDPs)
- Develop randomization strategies through game-theoretic models

An example scenario:

Coordination in multi-agent systems



- Node (N) exchange messages to visit targets (T) to provide coverage
- Attacker decides which signals to jam

Scientific Impact:

- Application of game theory, decision theory and optimization theory to cyber security
- Solve large decision problems in which optimal decisions (from both offensive and defensive sides) are computationally prohibitive to obtain

Broader Impact:

- Help Build safe and trustworthy Cyber-Physical Systems
- Hosting elementary, middle and high school students in our labs for demonstration sessions with robots and drones

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