Resilient CPS Monitoring

CPS Monitoring

Monitoring cyber-physical systems

* potentially very large area
* only a limited number of sensors can be placed

Where to place the sensors?

Gaussian processes

* each potential measurement is modeled as a random variable
* prior means and (co)variances are given
* goal: minimize the posterior variance (i.e., uncertainty) of predictions

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Resilience to DoS Attacks

Attack model

* Denial-of-Service (DoS) type attacks:
  wireless jamming, physical destruction, etc.

* Attacker removes a limited number of sensors

Resilient design: minimize uncertainty for the worst-case attack

Chart legend:
- Non-resilient design
- Resilient design

Y-axis: Variance (i.e., uncertainty) — 0, 0.04, 0.08, 0.12, 0.16, 0.2
X-axis: without an attack, after an attack

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