Diagnosis Properties by Design

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Diagnosis Properties

DX Focus
- Models
- Algorithms
- System Properties

Example of Properties
- Diagnosability (and variants)
- Cost of computing diagnosis
- Cost of acquiring observations
- Privacy
# Issues for Real World Networks

## Model
- Is available very late (diagnosis is not a number one priority)
- Changes quickly (network)

## Complexity
- Testing diagnosability on the global model is hard
- Testing diagnosability when the network requires reconfiguring is not an option
Property by Design

Given
- building blocks: component models
- design rules: how the components can be connected
determine if the properties are satisfied

Advantages
- Early computation: the final design is not necessary
- Early feedback: allow to point out design flaws (from a diagnosis perspective) early
- Computed once and for all: as long as the design rules are satisfied, the properties are satisfied
Property by Design

Given
- building blocks: component models
- design rules: how the components can be connected
determine if the properties are satisfied

Drawbacks
- Is undecidable in general
- Puts a strong constraint on the network
Design Rules

How to Make the Rules Applicable
A slightly incorrect design should be easy to correct
- Understandable rules (not a “black box” decision)
- Local rules

How to Test the Property
Because the network is unbounded, the property must be proved locally
- Local rules
Examples

Model-Checking

Planning

Uses node labeled controlled graph grammars
A branching point should be connected to a circuit breaker or to an electrical equipment with a sensor attached to it.
Design Rules Synthesis
Given a set of component types, generate the design rules

Contracts
???