Bridge DSS

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Outline

Research Question

What are the costs and benefits of installing a decision support system (DSS) based on real-time sensor data, for the purpose of bridge maintenance, on a no-prestress no-postension concrete slab bridge?

Existing Bridge DSS

Research

Types of Bridges

- Research

Bridge Model

Model Inputs

Code: Pier Displacement

Data Collection

Model Assumptions

Verified Model

Code: Fix deck sections

Events

Code: Distribution of responses

Costs

Research

Overview

2D Model	Model Generation	+
2D Model	X, Y, Z -translation	&
2D Model	Stress & Strain	+
2D Model	Pier Displacement	+
3D Model	Model Generation	+
3D Model	X, Y, Z -translation	+
3D Model	Stress & Strain	-
3D Model	Pier Displacement	-
3D Model	Verification	&
Data Collection	Influence Lines	+
Data Collection	Event Generation	+
Model Input	Noise	&
Model Input	Traffic	&
Model Input	Low frequency Events	-
Anomaly Detection		-
Bridge Types & Costs		-

Plan

November week 1	writing & costs
November week 2	writing & classifiers
November week 3	verification plot 1 & strain
November week 4	verification plot 2 & classifiers
December week 1	writing & temperature
December week 2	writing & soil creep
December week 3	writing
December week 4	writing

Key goals

- Verified extensible FEM
- System : bridge model -> inputs -> events
- Anomaly detection
- Avoid detecting low frequency events

Anything missing?

- Comparison of 2D/3D FEM responses.
- Comparison to another bridge.

Muchas Gracias

Future collaboration

- Dutch student
  - Live at home & free travel
  - Easier to find a place to live
- Don't start thesis until long-term housing is found