Post-disaster Infrastructure Assessment with Non-conventional Operations (PIANO) of UAS


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A NIPP Security and Resilience Challenge Project

Create methods to perform automated post-disaster damage assessment to accelerate recovery and restoration after large scale natural disasters.
Motivation
Approach
Data Collection
Data Collection
Data Processing

Reference Wall

Door

Side Wall

Gap
Semantic Modeling

Target object assigned to the UAV

- Deck
- Barrier
- Abutment
- Ground
- Bearing
- Columns
Types of Damages

Concrete Crack

Multiple Cracks
Types of Damages

Alignment (columns)
- A3/0.07"
- B3/0.16"
- C3/0.26"
- D3/0.78"
- E3/0.56"
- A2/0.34"
- B2/0.28"
- C2/0.20"
- D2/0.25"
- E2/0.25"
- A1/3.62"
- B1/2.20"
- D1/1.84"
- E1/1.81"

Alignment and point of discontinuity (beams)
- AB3/0.09"
- BC3/5.85"
- CD3/5.87"
- DE3/0.11"
- AB2/0.07"
- BC1/5.31"
- CD2/4.81"
- DE2/0.09"
- AB1/0.06"
- BC1/5.02"
- CD1/4.31"
- DE1/0.09"
Types of Damages
Towards Autonomy
Call to collaboration

Bridges with concrete decks
Open steel structures
Above-ground pipelines
Dams/levees