

UAV-Based Infrastructure Monitoring Inspection and Change Detection

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Introduction

As America's infrastructure continues to age, expand, and become more complex, the amount of monitoring required to maintain it is rapidly becoming unsustainable due to limited funds and human resources. The long-term objective of this research is to use UAVs to automate the monitoring/inspection of critical aspects of infrastructure including, but not limited to: pipelines, levees, dams, bridges, canals, roads / pavements, and buildings.

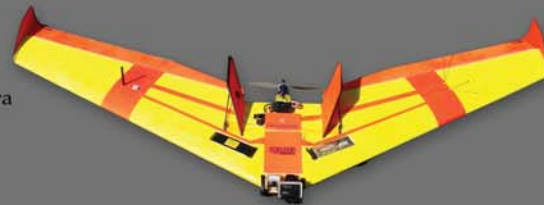
Project Goals

- Create suitable test environments to simulate infrastructure anomalies.
- Experiment with various sensors to optimize detection of infrastructure anomalies.
- Develop UAV flight methods to optimize infrastructure anomaly detection.

Platforms

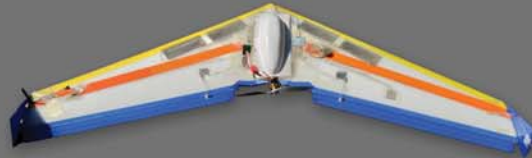
Platform One:

Ritewing 81" ZXL
Sensor: GoPro Hero 3 Camera
Control: RC/FPV
Flight Time: 25 minutes



Platform Two:

Procerus 72" Unicorn
Sensor: Gimbaled Camera
Control: Kestral Autopilot v2.2
Flight Time: 40 minutes



Sensors



GoPro Hero 3 Black Edition
Resolution: 1440x1990
Frame Rate: 48 fps



Sony FCB IX11A Block Camera
Resolution: 640x480
Frame Rate: 15 fps

Test Sites

Joe's Valley Reservoir

Location: Emery County, UT
Dam Height: 192 ft.
Dam Length: 750 ft.



Huntington Lake

Location: Huntington, UT
Levee length: approx .5 km



Huntington Canal

Location: Emery County, UT
Canal Length: 16.7 miles
Flight Area: .5 miles



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