



*Pacific NorthWest
Economic Region*

Northeastern University
Global Resilience Institute



**Homeland
Security**

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

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Acknowledgements:


Massachusetts Department of Transportation
DGT Associates
UAS Development
MassRobotics

STReSS LAB

Laboratory for Structural Testing of Resilient and Sustainable Systems



robotics
collaborative

An aerial photograph of a large industrial facility, possibly a refinery or chemical plant, featuring numerous storage tanks, distillation columns, and complex piping systems. The facility is situated in a flat, open area with some greenery and a body of water visible in the background. A semi-transparent circular overlay is positioned on the left side of the image, containing the project title and description.

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



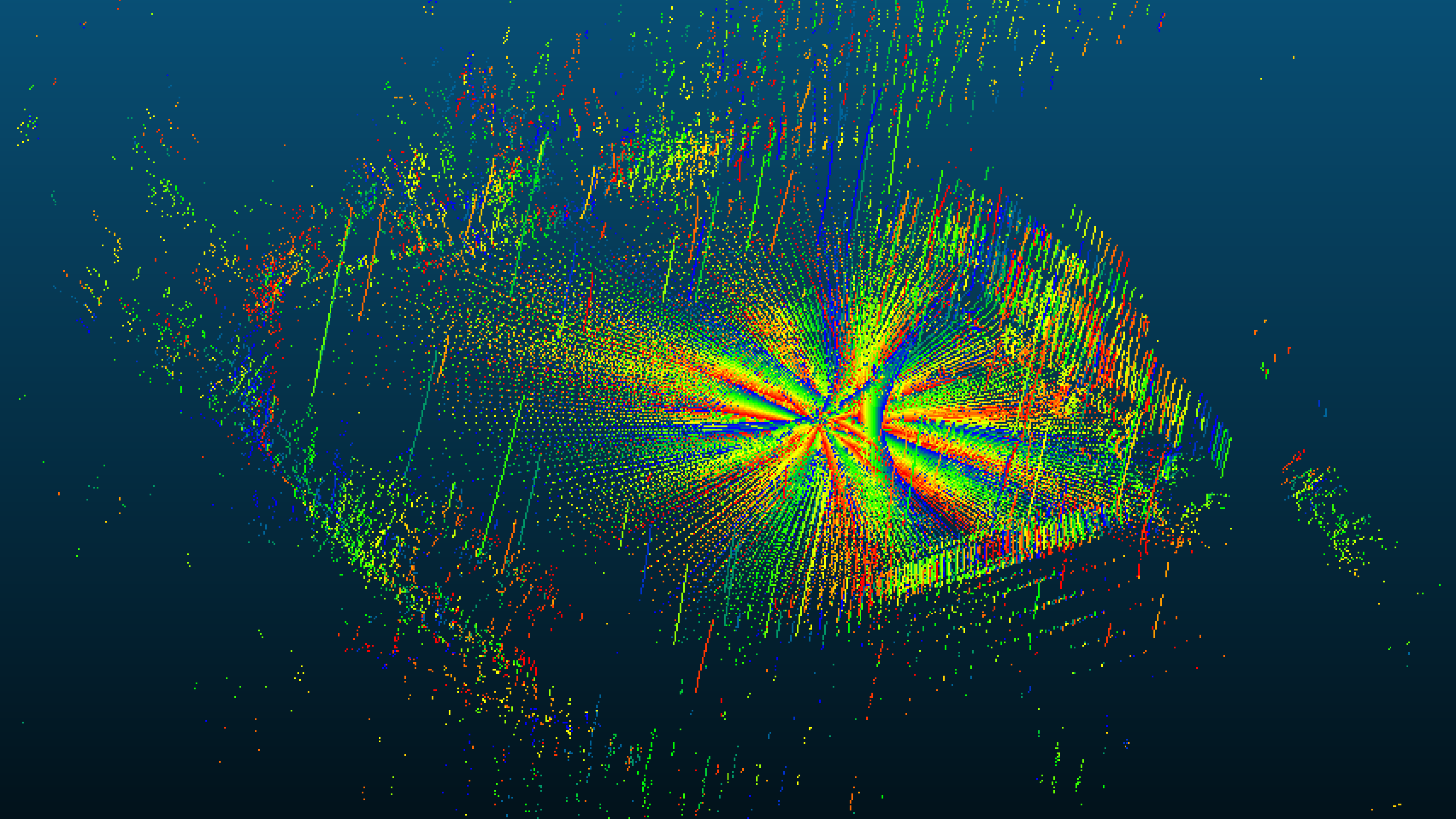






Approach

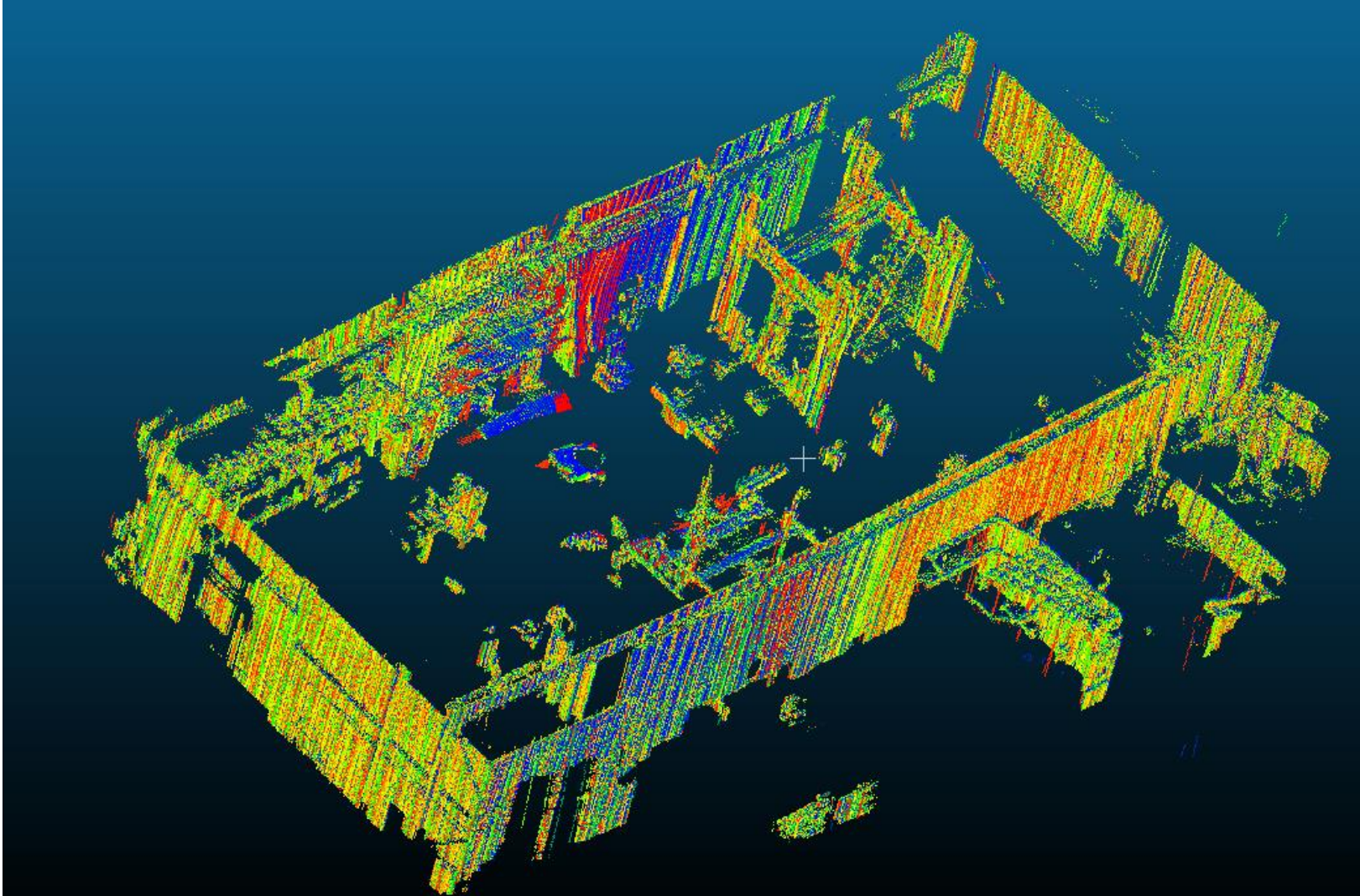




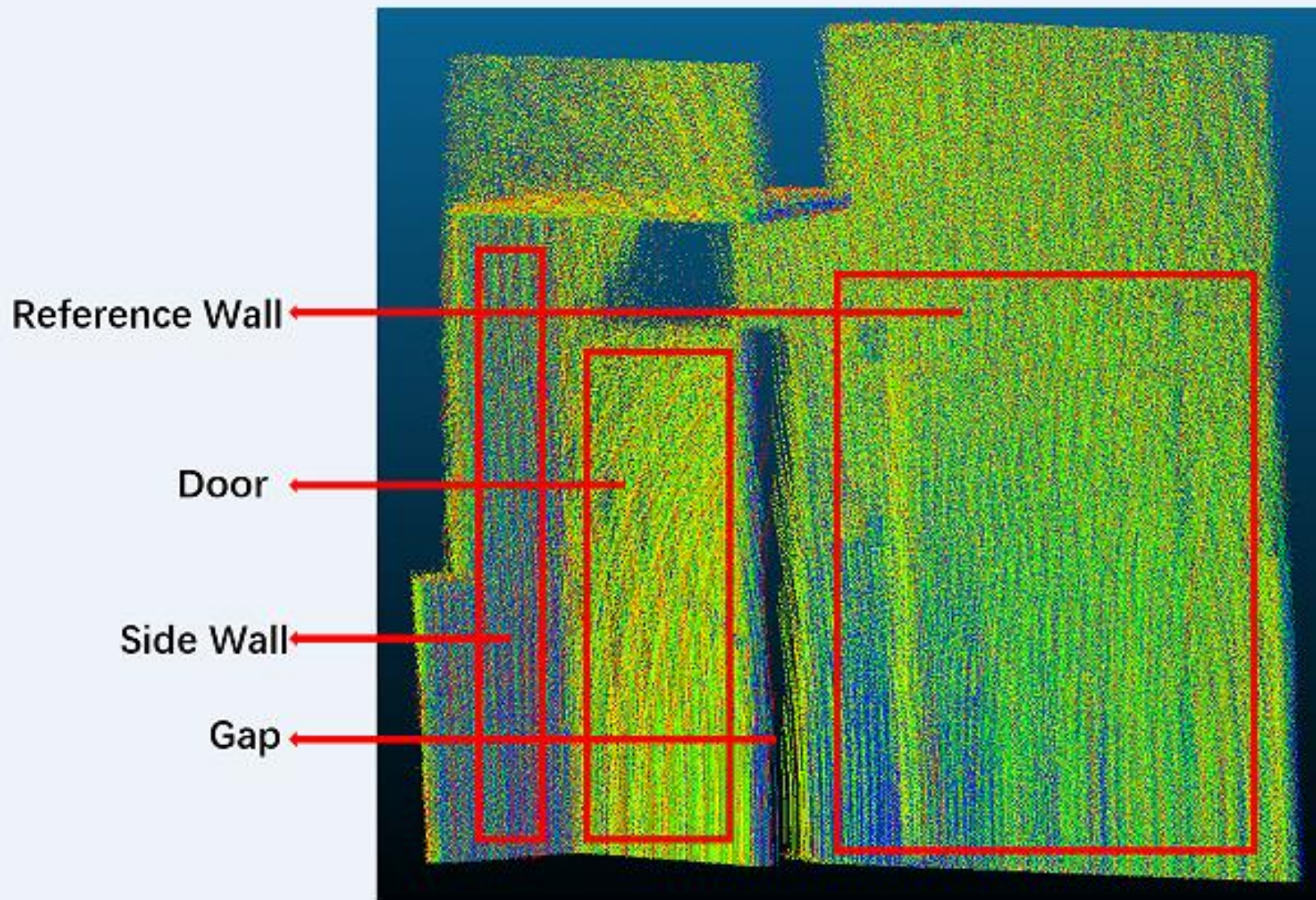
Data Collection



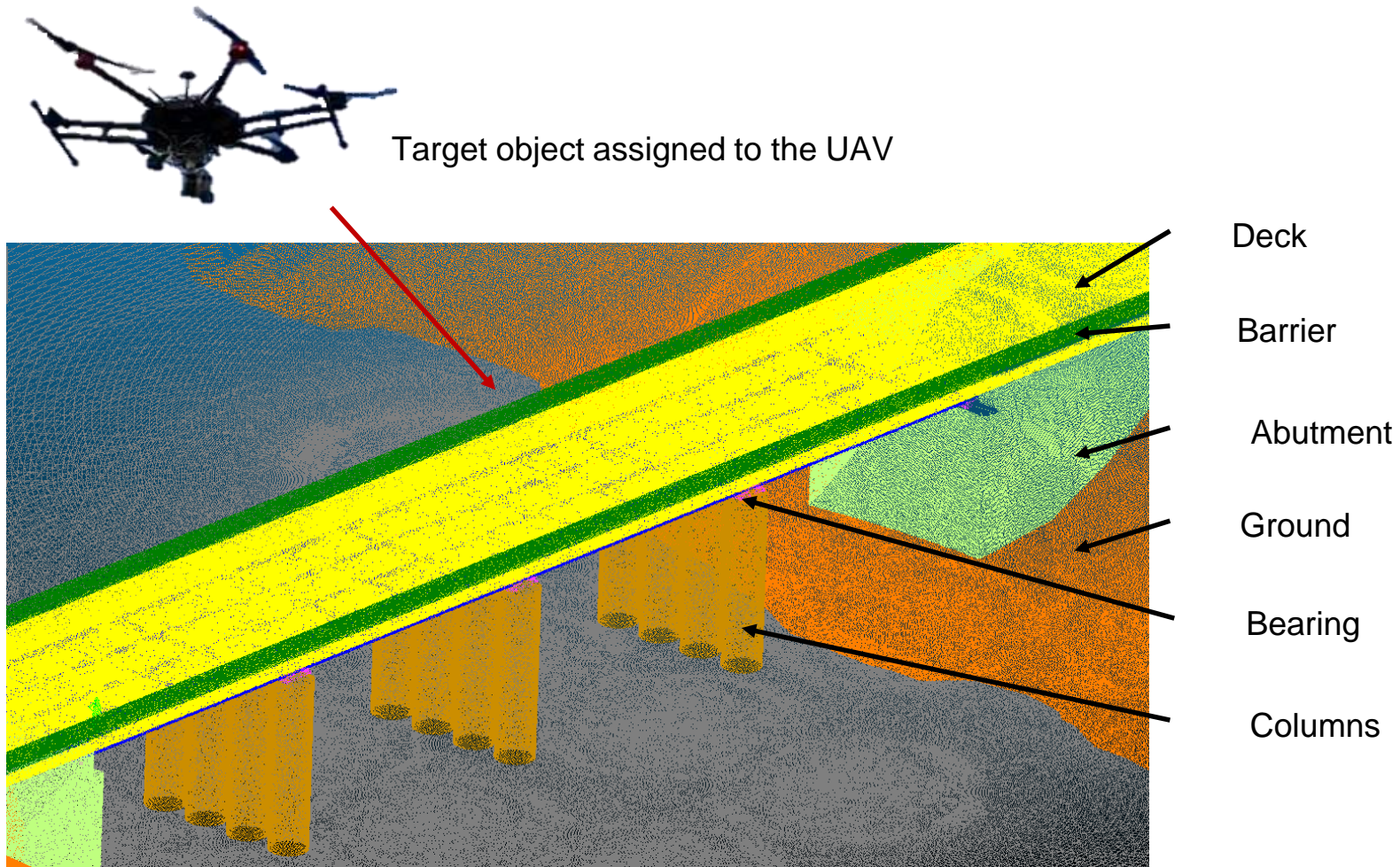
Data Collection

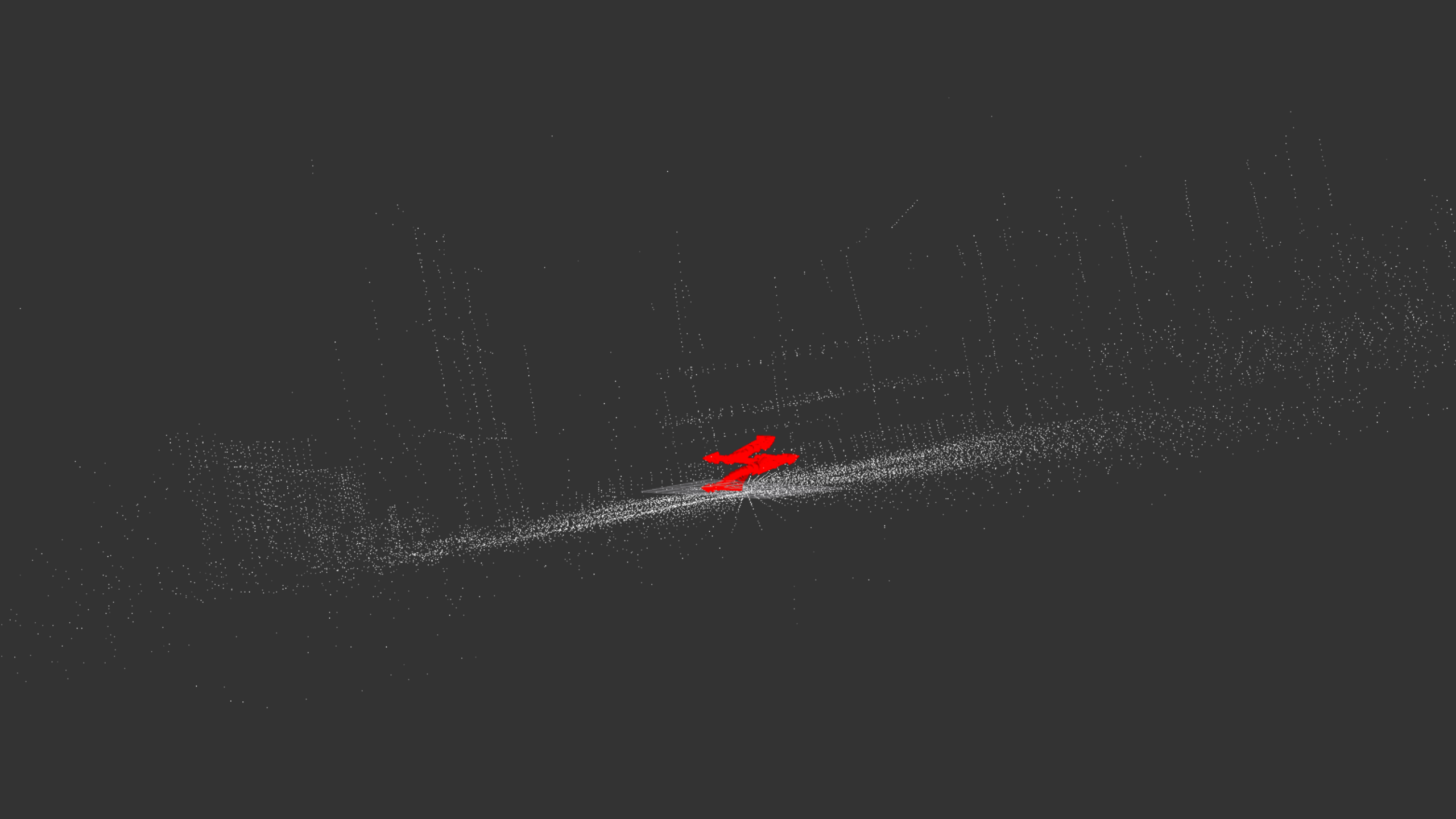


Data Processing



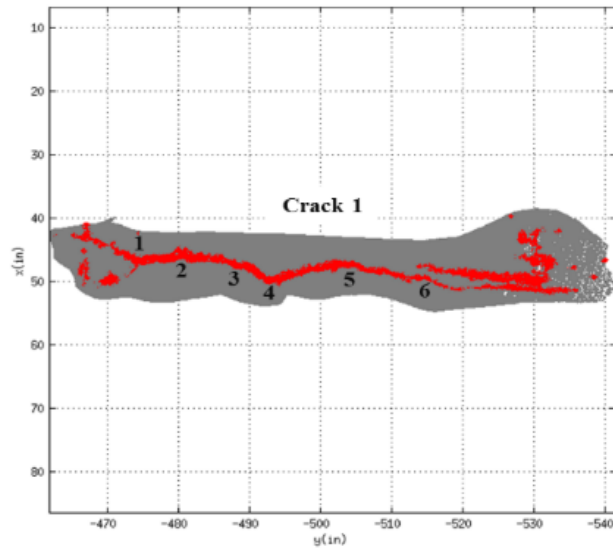
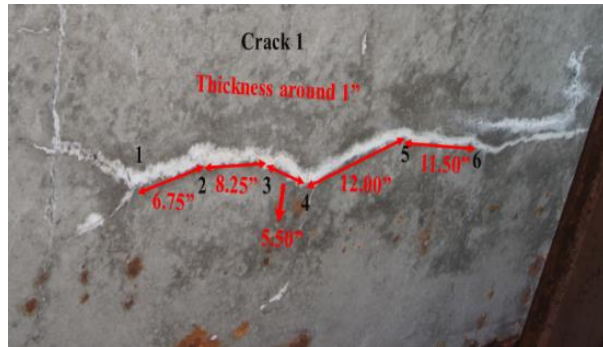
Semantic Modeling



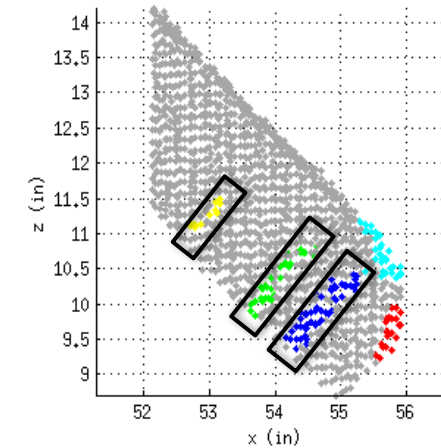
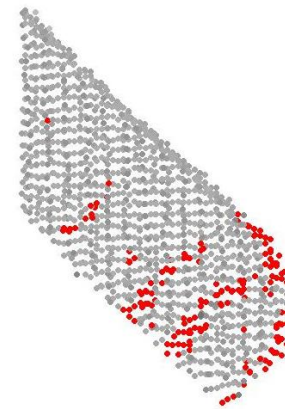
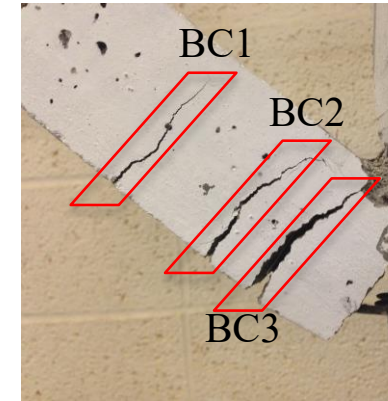


Types of Damages

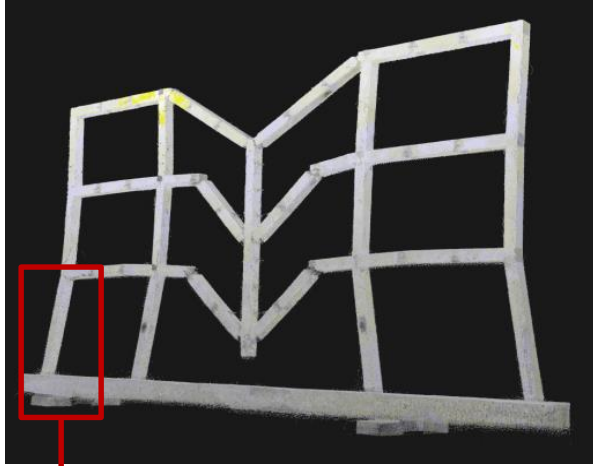
Concrete Crack



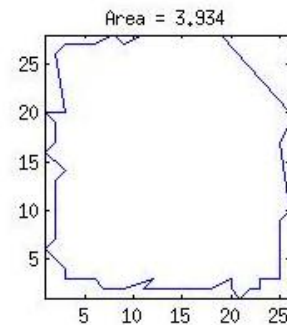
Multiple Cracks



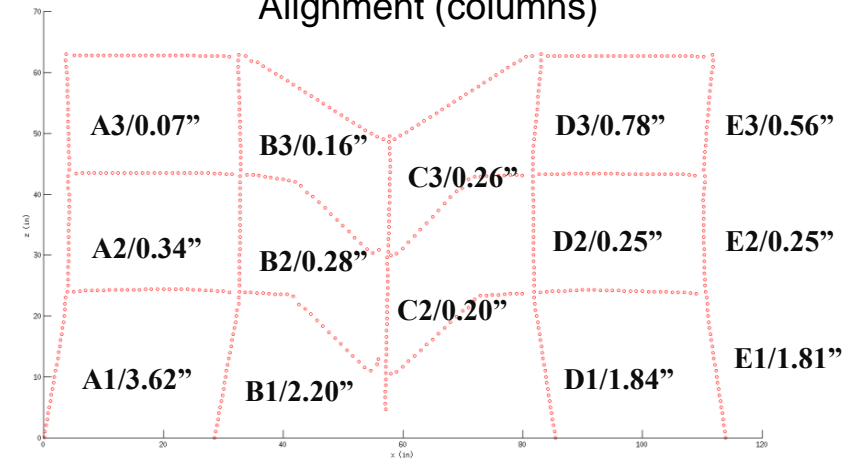
Types of Damages



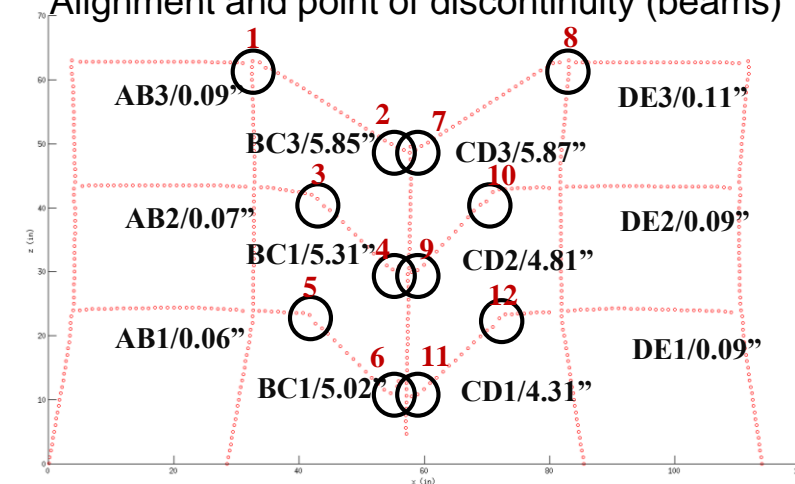
Cross-section change



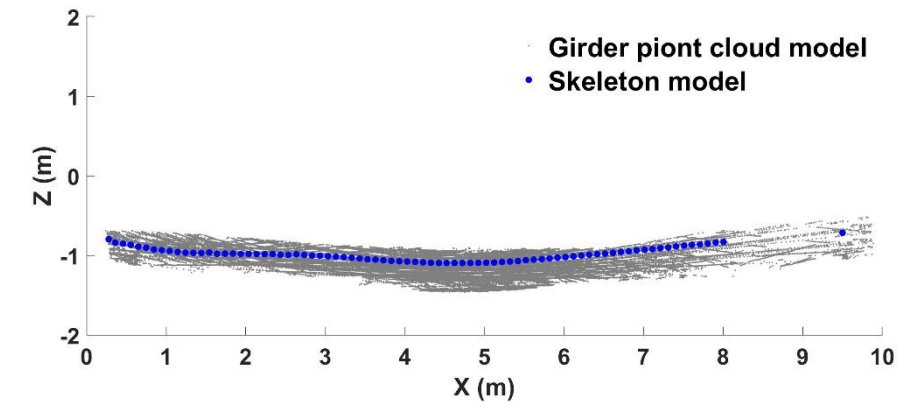
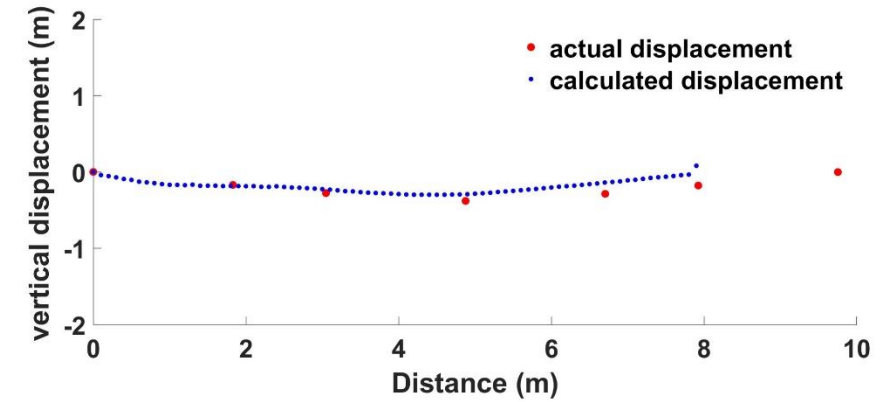
Alignment (columns)



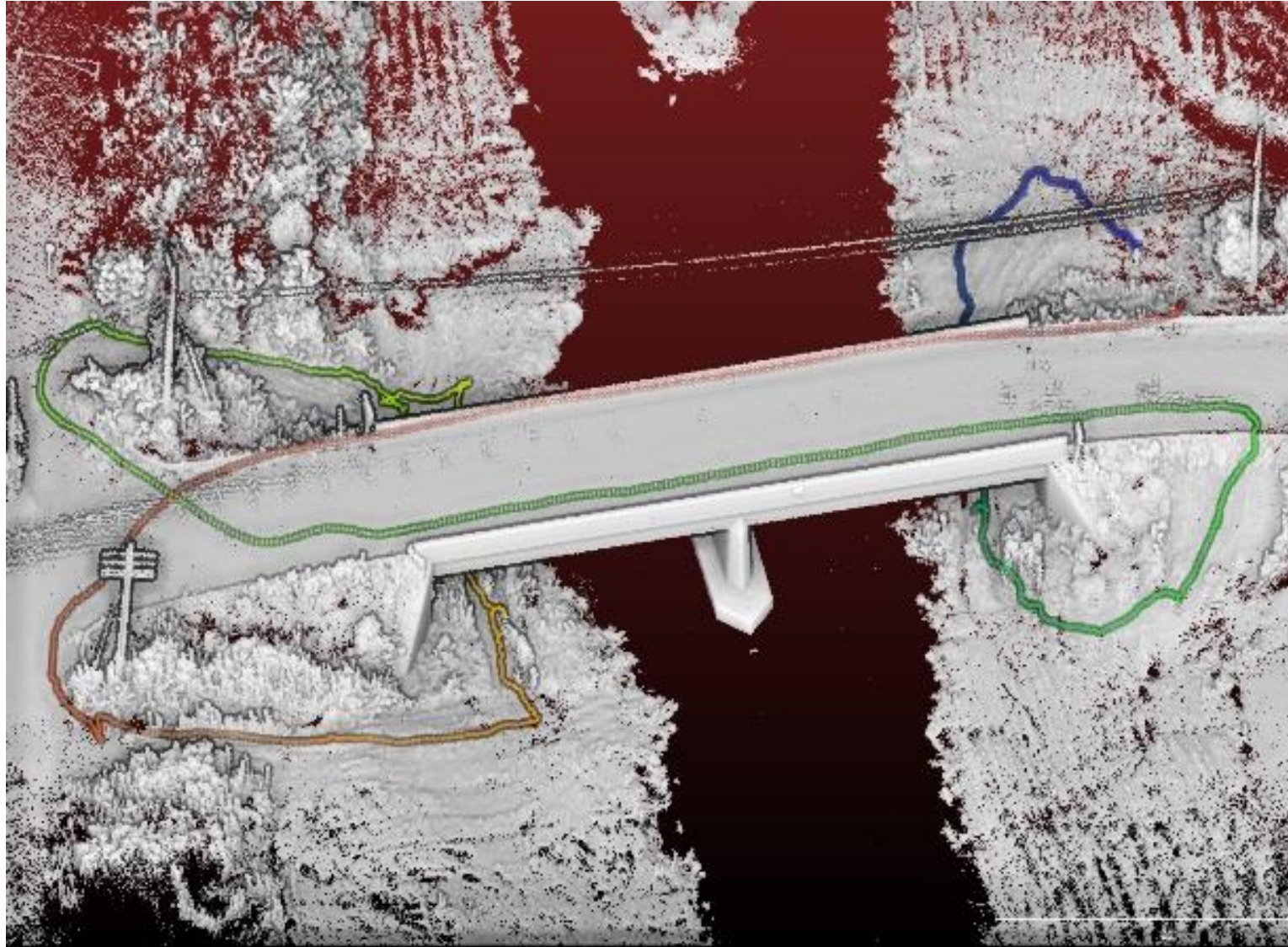
Alignment and point of discontinuity (beams)



Types of Damages



Towards Autonomy



Towards Autonomy



Call to collaboration

Bridges with concrete decks

Open steel structures

Above-ground pipelines

Dams/levees

