

An aerial photograph showing the aftermath of the Champlain Towers South collapse. A large, multi-story building has partially collapsed, leaving a massive pile of rubble and debris. Several construction cranes and excavators are positioned around the site, actively working on the debris field. To the left of the collapsed building is a large, circular, modern building with a curved facade. The surrounding area includes green spaces, parking lots, and other residential buildings. The text "RAPID: COLLABORATIVE RESEARCH: Robot Data Collection at Champlain Towers South Collapse" is overlaid in yellow at the top of the image.

RAPID: COLLABORATIVE RESEARCH: **Robot Data Collection at Champlain Towers South Collapse**

PI: Robin Murphy, Texas A&M University

Co-PI: Howie Choset, Carnegie Mellon University

Co-PI: David Merrick, Florida State University

GRA: Ananya Bal, Ananya Rao, Laura Hart

REU: Karim Zahner

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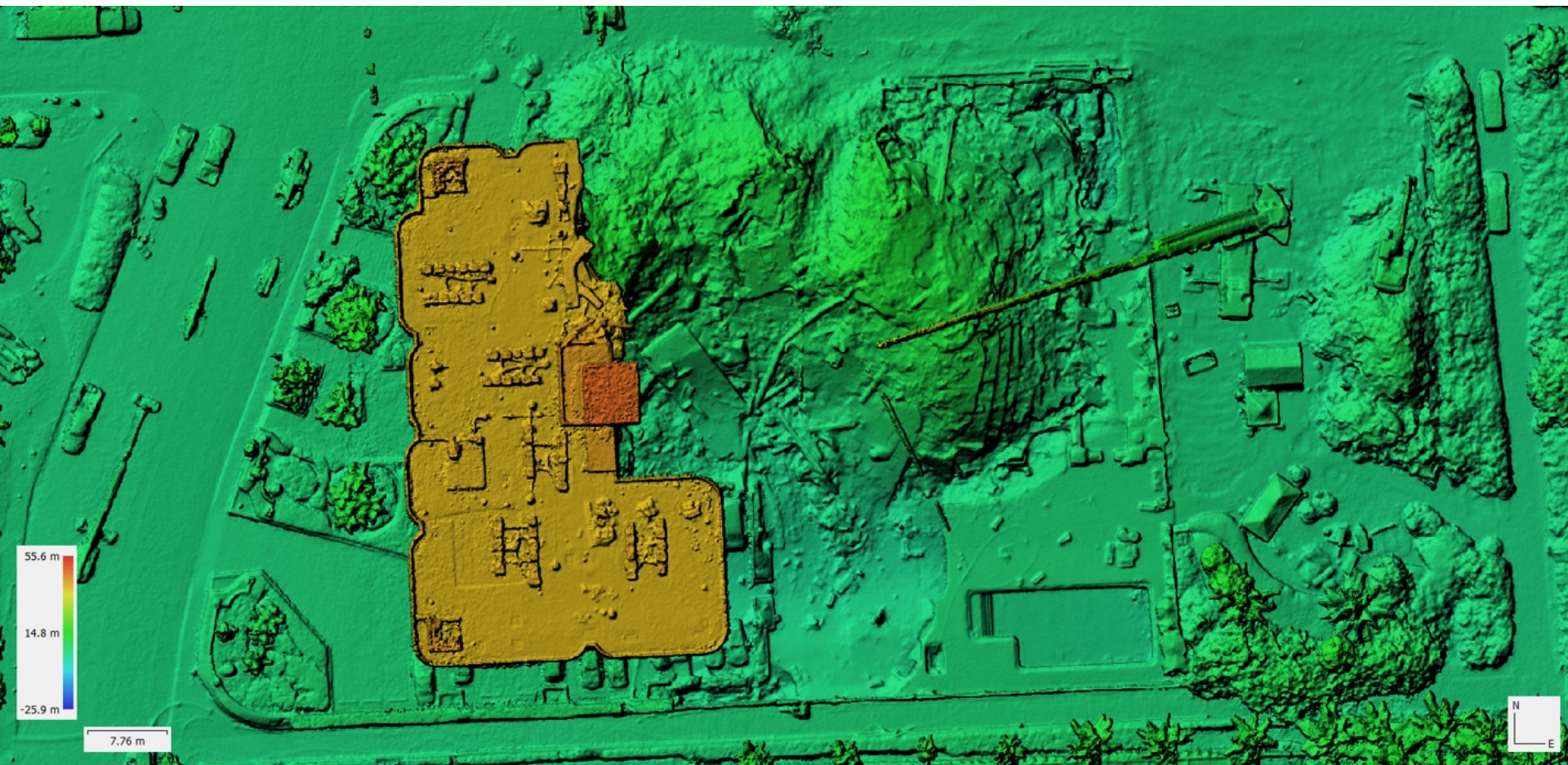
Robots Used at Previous Collapses



Location of Victims Who Might Have Survived







Apartment Numbers

- Apt. 1
- Apt. 10
- Apt. 13
- Apt. 12
- Apt. 2
- Apt. 3
- Apt. 4
- Apt. 5
- Apt. 6
- Apt. 7
- Apt. 8
- Apt. 9
- Other

Search Segment Status

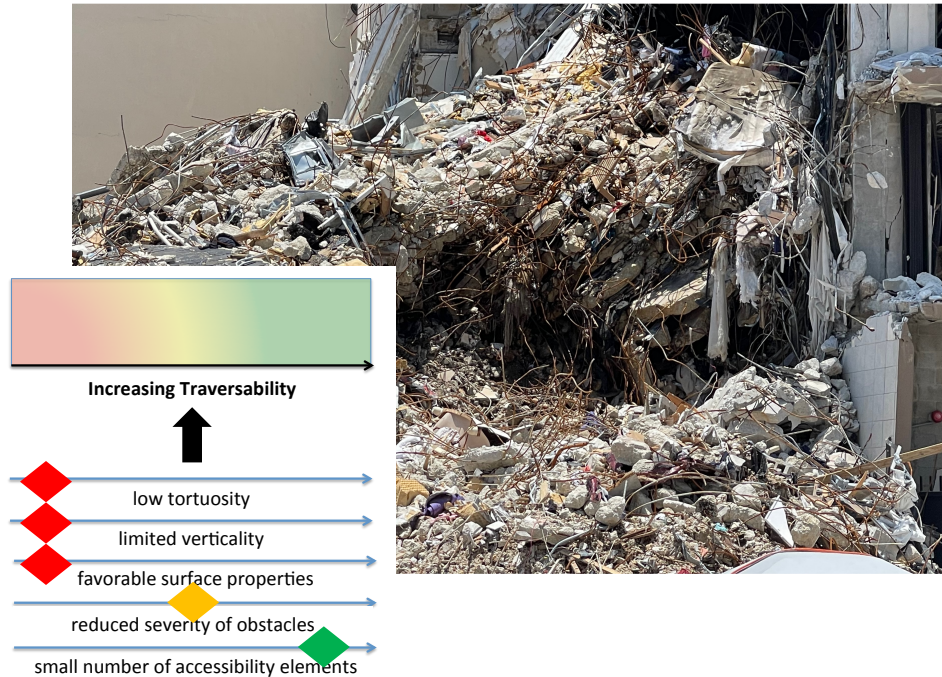
- Quashed
- Assigned
- Underway
- Complete
- Other

Imagery 05 Jul 2021 0800 EST

- Red: Band_1
- Green: Band_2
- Blue: Band_3

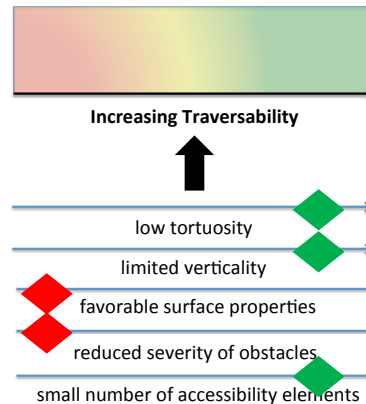


Traversability is Generally Unfavorable



- may need to go down ~6 m to get to lower floors
- void will most certainly twist and turn (WTC)
- May encounter other regions with different scales, traversability
- Obstacles may be treated like boundaries of the void

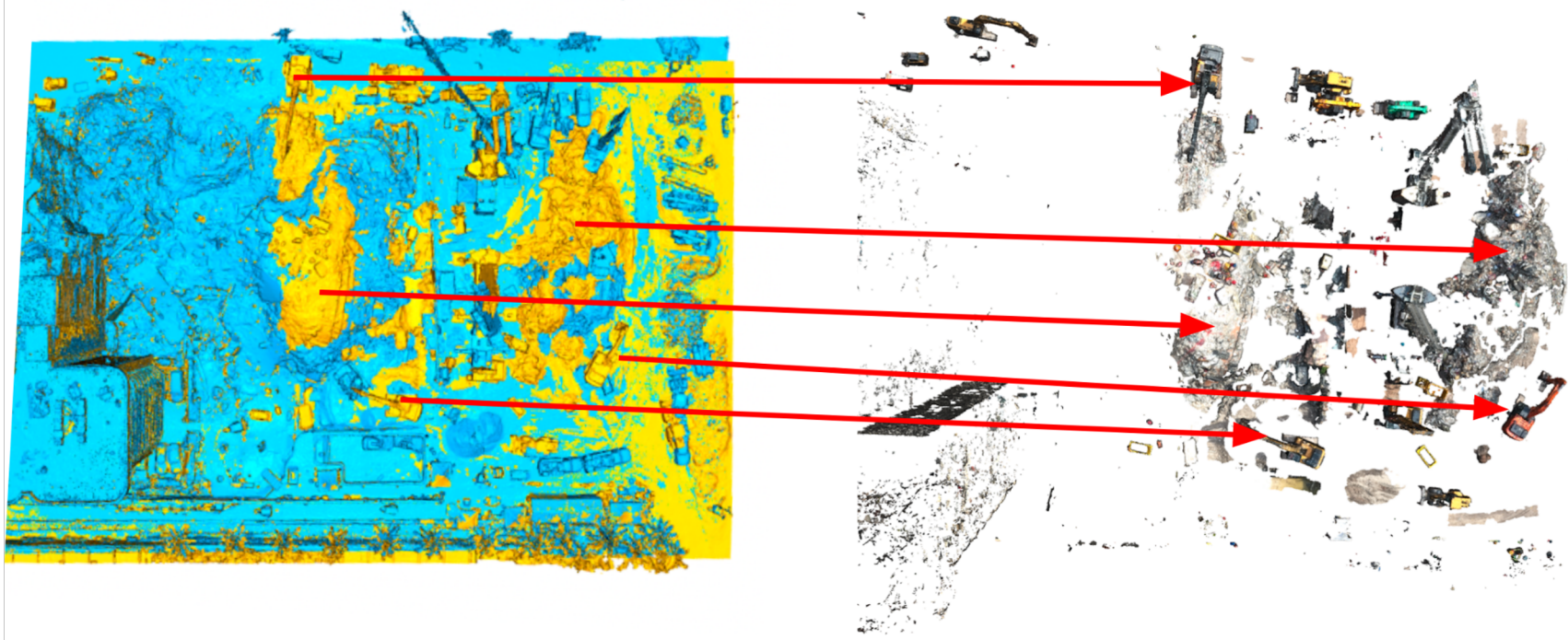
Traversability is More Favorable IF the Robot is Small Enough and Agile



- more horizontal
- columns and debris may block movement horizontally, vertically, and pose insurmountable obstacles (Berkman Plaza II)
- Change in regions to more open space

Registered Source
and Target Slices

Source Slice with Points which have reduced in
height in the target slice



Feature Correspondences depicted by red arrows from 2 registered point clouds (left) to segmented point cloud regions (right) generated by using height differences

Intellectual Merit

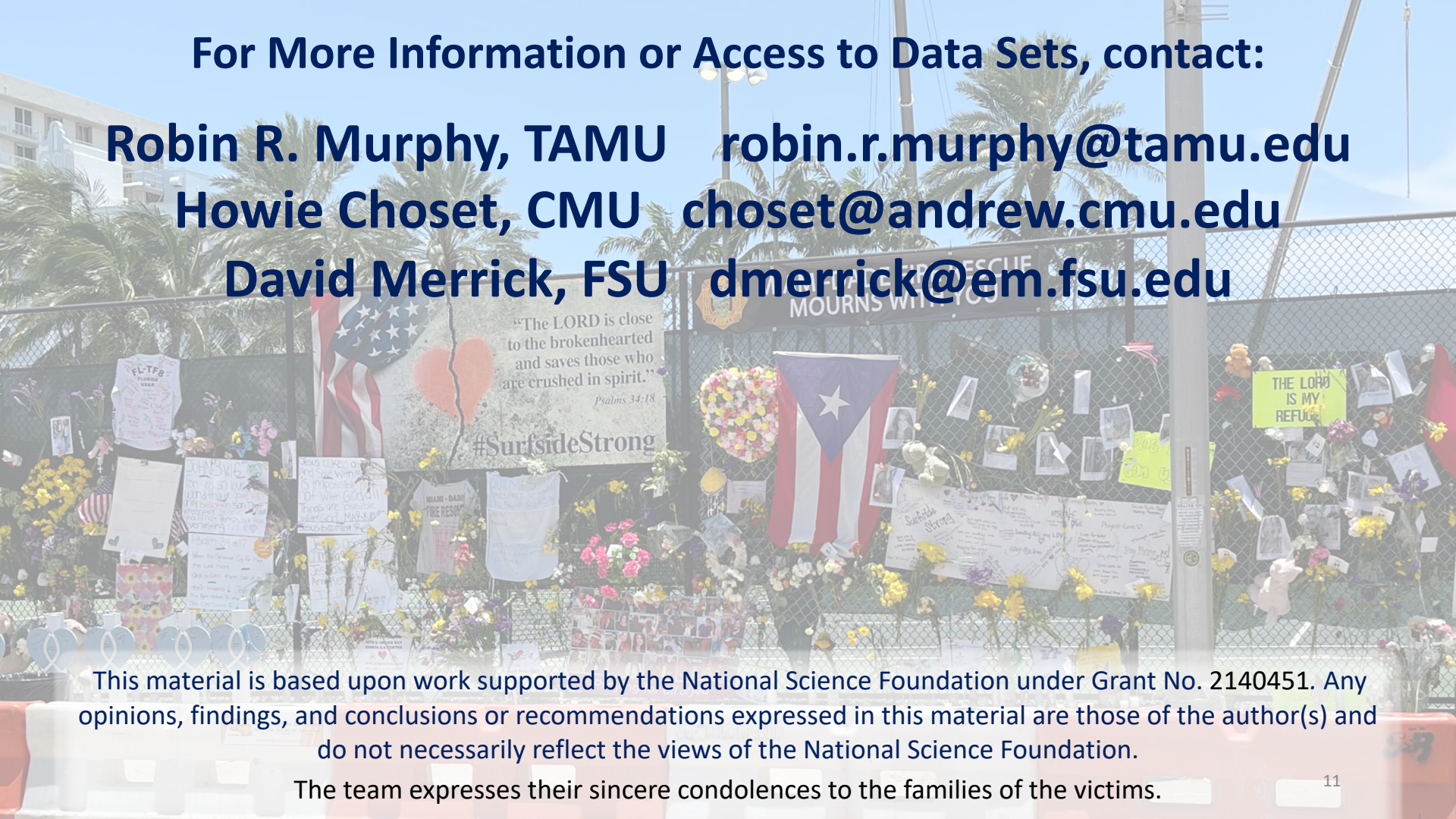
- Design objectives and constraints for interior rubble
- Methodology for analyzing disasters
- Open datasets for computer vision, machine learning, UAS performance

For More Information or Access to Data Sets, contact:

Robin R. Murphy, TAMU robin.r.murphy@tamu.edu

Howie Choset, CMU choset@andrew.cmu.edu

David Merrick, FSU dmerrick@em.fsu.edu



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The team expresses their sincere condolences to the families of the victims.