Virginia Tech

VEHICLE TERRAIN PERFORMANCE LABORATORY

PE/RPUG Demonstration

Sunday, September 14

John B. Ferris
Associate Professor, Mechanical Engineering
Director, Vehicle Terrain Performance Lab

Outline

Brief Lab overview (5 minutes)

Discussion of Demonstration (5 minutes)

Lessons Learned (5 minutes)

Who we work with…

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Military

Commercial

JOHN DEERE

Government

Dr. John B. Ferris
Associate Professor

Vehicle Terrain Performance Laboratory

What we do…

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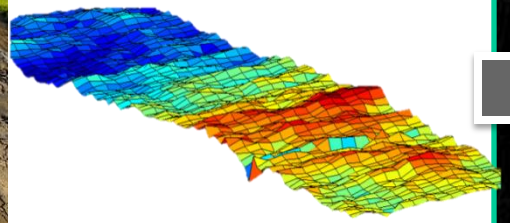
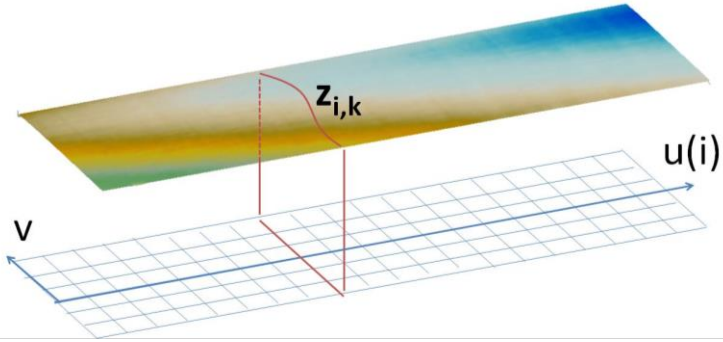


Terrain Measurement



Terrain Modeling

Vehicle Modeling

Analysis and Prediction

- **Virtual Proving Grounds**
- **Driver Assistance Systems**
- **Automated Vehicles**

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Discussion of Demonstration

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Big Picture

- Traceable to ground truth
- Necessary, but not sufficient
- Evaluate the Process

Attendees

- Pathways
- Waylink

- Photography by David Luhr

Discussion of Demonstration

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Static testing

- Flatness
- Linearity

Discussion of Demonstration

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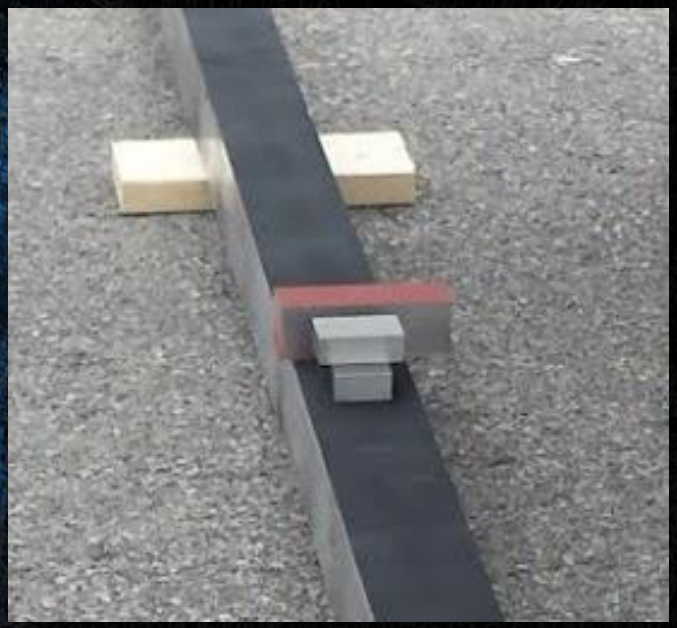

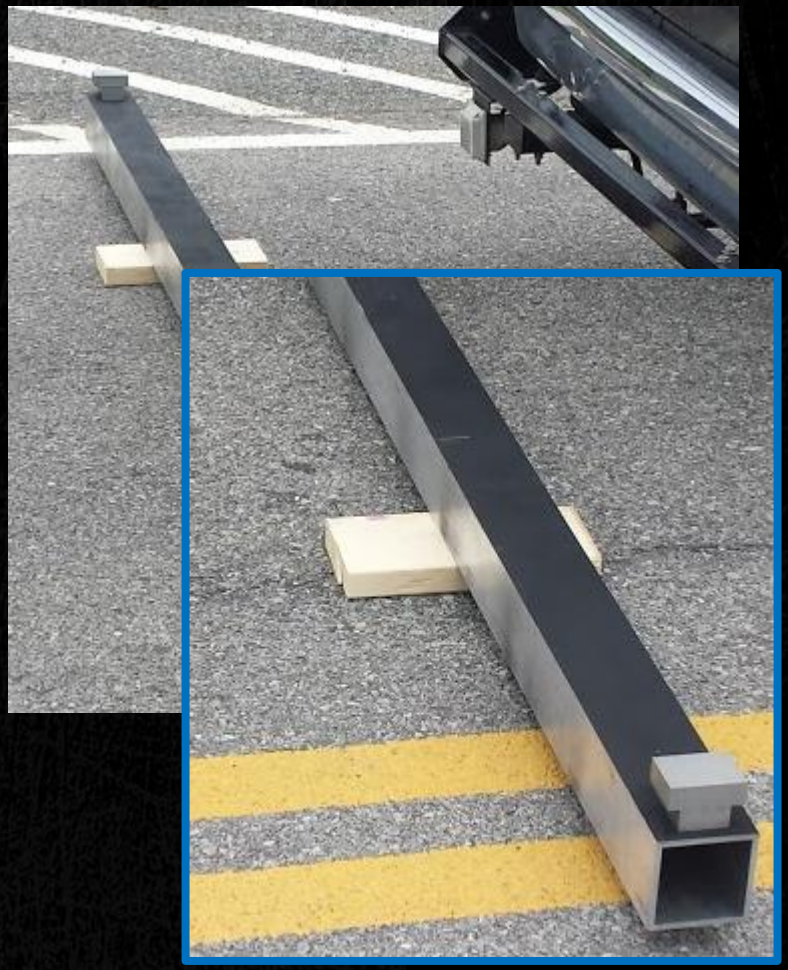

Discussion of Demonstration

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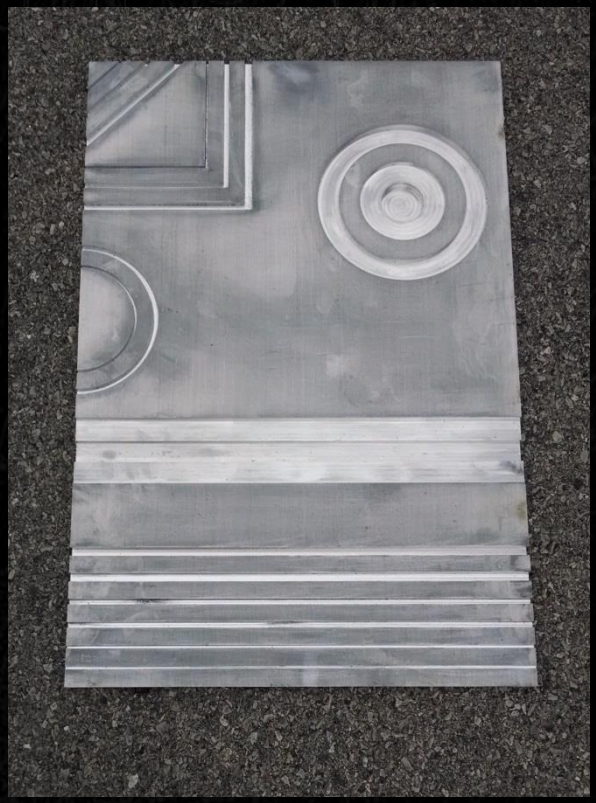
Dynamic Tests

- Crack measurement
- Drift identification

Two Vehicle States

- Smooth
- Excited



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Dynamic Tests

- Smooth
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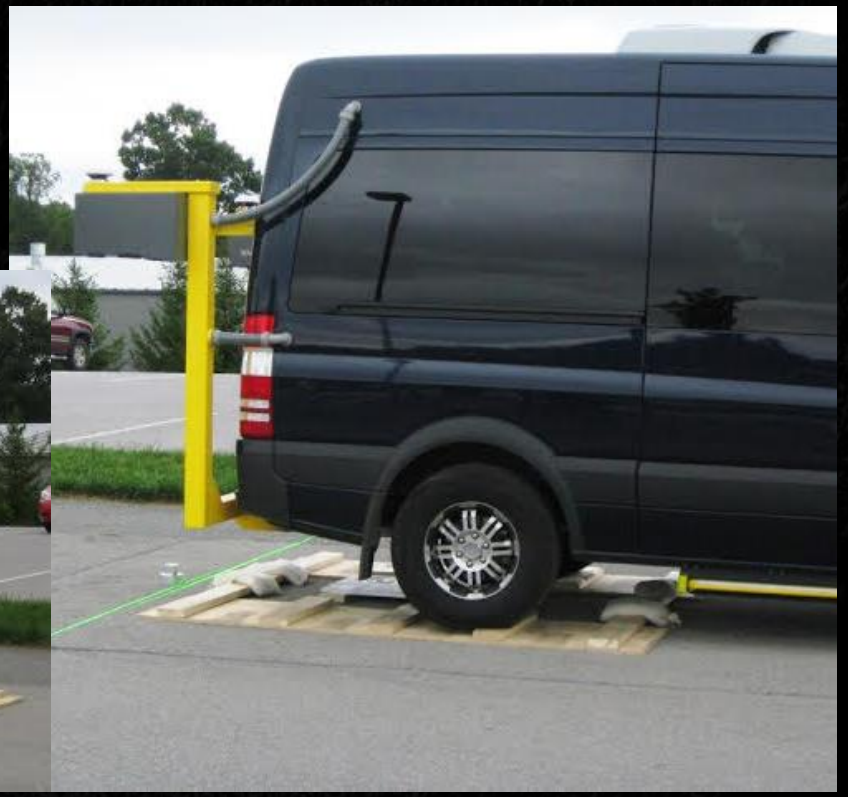

Lessons Learned

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Things to keep

- Process and organization ran smoothly
  Thanks to Edgar, Billy, Kenny, VTTI, and my students!
- Excitation events worked well (need to glue boards)

Things to change

- Less reflective calibration surfaces (yes, you all told me so…)
  - Anodized aluminum, sand/bead blast, paint, stone
- Calibration surfaces closer to ground level
- Placement and height of gauge blocks (more options)
- Another set of excitation boards (more excitation and add roll)

Other thoughts? Thank you!