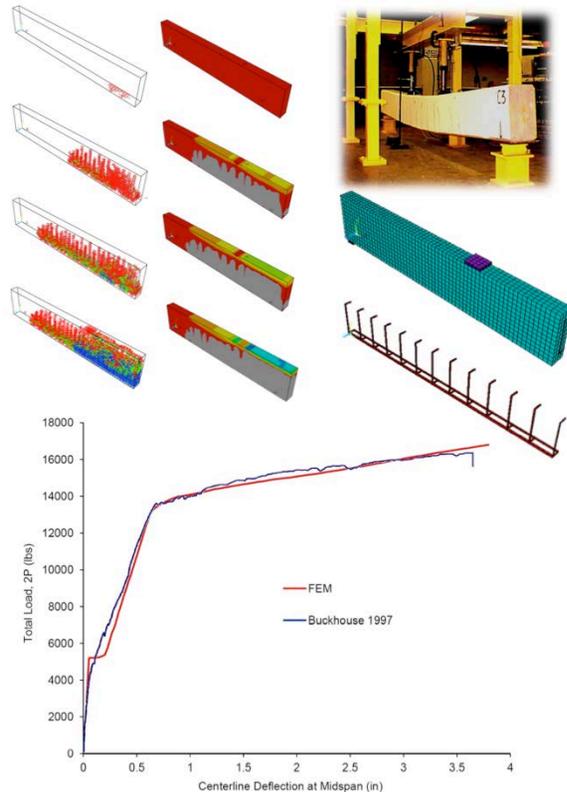


Structural Engineering Group



Our research focuses on structural engineering. Specifically, we are interested in bridge behavior, condition assessment and structural health monitoring, reinforced and prestressed concrete behavior, the application of innovative materials in civil infrastructure, and railroad engineering. Our research approach often utilizes a combination of laboratory and field investigations and finite element modeling.

Devin Harris

Assistant Professor

dharris@virginia.edu

pages.shanti.virginia.edu/Devin_Harris-Collab_Site/

Dept. of Civil and Environmental Engineering

University of Virginia

Charlottesville, VA

434.924.6373

“Research designed for the future of structures that are quick, cheap, easy and last a long time.”



Bridge Engineering and Behavior

The deteriorating condition of the aging bridge superstructures across the nation challenges the reliability of transportation infrastructure network; whilst jeopardizing the economic health of the United States. Although the occurrence of sudden bridge failures due to unpredicted phenomena such as impact, flooding or other natural disasters is somewhat rare, the existence and propagation of any type of damage condition can significantly reduce the performance and serviceability of these superstructures. Our research is focused on creating a framework for integrating the most common damage mechanisms into a measure of system performance and correlate impacts of damage on system behavior and reserve capacity of routine highway bridges.

Structural Health Monitoring

We are exploring the use of remote sensing technologies for bridge condition assessment. For the typical bridge engineer, the concept of remote sensing can mean enhanced and safer inspection assessment without traffic disruption. Specifically, we are looking at the applicability of commercially available technologies, implemented in series, as a means to assess and monitor bridge performance while providing state and local engineers with additional information in the form of a decision support system that can be used to prioritize critical maintenance and repair of the nation's bridges.

Innovative Materials for Infrastructure

Concrete bridge decks represent a critical component of the nation's bridge network; however, these components are deteriorating at a rapid rate. This deterioration can be attributed to a number of factors, but winter salt application, the diffusion of chlorides to the reinforcing steel and the eventual corrosion is the primary culprit. Multiple protection solutions currently exist but each have shortcomings and do not completely address the problem. We are exploring the use of ultra-high performance concrete (UHPC), a relatively new material with exceptional strength and durability characteristics, as an alternate solution to traditional concrete bridge deck materials.

RECENT RESEARCH DEVELOPMENTS

- Established mobile laboratory for rapid evaluation of transportation infrastructure.
- Developed collaborative research project, "Structural Health Monitoring to Determine Long-term Behavior of AFRP Composite Bars in Prestressed Concrete Panels for Field Deployment", with Morgan State University.

RECENT GRANTS

- Virginia Center for Transportation Innovation & Research – In-service Performance Evaluation & Monitoring of the Hybrid Composite Beam Bridge System on Route 205 over Tide Mill Stream
- Michigan Technological University – National University Rail Transportation and Education Center (NURail)

SEAS Research Information

Pamela M. Norris, Associate Dean
University of Virginia
Box 400242
Charlottesville, VA 22903
pamela@virginia.edu
434.243.7683

