

Department of Civil & Environmental Engineering
University of Connecticut
Storrs, CT 06369

Undergraduate Research Opportunities

Faculty Advisor: Ramesh B. Malla, Ph.D. F. ASCE, F. EMI, A.F. AIAA, F. ASNEngr, M. CASE;
Professor, Department of Civil & Environmental Engineering
Research Field: Structural Engineering and Applied Mechanics
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Project Descriptions

(1) Project Title:

Design and Analysis of Lunar and Deep Space Habitat Structures

The research team supervised by Prof. Ramesh B. Malla intends to host two students with competencies in physics, math, and structural and mechanics related engineering fundamental knowledge. Students at the level of Junior or Senior are preferred. The students should have relevant coursework on mechanics, structural analysis, design, modeling and construction materials. These competencies are necessary to contribute to the research of development and analysis of Space structures/habitats, and construction of a physical testbed, meant to simulate a Lunar habitat and associated environmental hazards. This research requires working with computer models to simulate conditions experienced on the Lunar surface (including temperature fluctuations, meteorite impact, and radiation), construction of a model Lunar habitat for physical testing, and working closely with other researchers in the lab to deliver models and reports. Students with MATLAB and/or other computer programming and experience with structural design and analysis software are preferred. Successful applicants stand to gain exposure to professionals in industry and government agencies, get the opportunity to work on NASA-funded projects researching deep space structures/habitats, improve their knowledge of structural analysis and design, and gain experience working in a research environment.

Project Mentor(s): -

- Ramesh B. Malla, Ph.D., F. ASCE, F. EMI, A.F. AIAA, F. ASNEngr, M. CASE; Professor
(E-mail: <ramesh.malla@uconn.edu>)
- Seungwook Seok, Ph.D., Post-Doctoral Research Associate
(E-mail: seungwook.seok@uconn.edu),
- Jeffrey Steiner, PhD Student (E-mail: jeffrey.steiner@uconn.edu)

URL for Faculty research page: <https://cee.engr.uconn.edu/people/malla-ramesh-b>

Other Project Related Links:

-UConn Researchers to Help Design Resilient, Deep-Space Habitats

<https://today.uconn.edu/2019/04/uconn-researchers-help-design-resilient-deep-space-habitats/>

-"Space Place," Civil Engineering monthly magazine, ASCE, January 2020.

<https://www.asce.org/cemagazine/space-place>

- NASA STRI Resilient Extra-Terrestrial Habitats Institute (RETHi)

<https://www.purdue.edu/rethi/>

(2) Project Title:
**Analysis, Modeling, Testing, and Monitoring of Railroad and Highway
Bridge Infrastructure**

The research team supervised by Prof. Ramesh B. Malla intends to host two students with a good understanding of physics, math, structural and mechanics related engineering fundamental knowledge. The student would have the opportunity to work on a project funded by the U.S. Department of Transportation (DOT) University Transportation Center (UTC) - Transportation Infrastructure Durability Center (TIDC). The research team's current effort includes finite element modeling, analysis and testing of railroad bridges to study dynamic behavior and to develop suitable structural health/condition monitoring system for the bridge structures. Students at the level of Junior or Senior are preferred. The students should have relevant coursework on mechanics, structural analysis, design, modeling and experience with structural design and analysis software engineering computer software. Successful applicants will gain exposure to industry and government agency professionals and get the opportunity to utilize their classroom knowledge to solve real-life problems, improve their knowledge on structural dynamics, analysis and design, and gain experience working in a research environment.

Project Mentor(s):

- Ramesh B. Malla, Ph.D., F. ASCE, F. EMI, A.F. AIAA, F. ASNEng, M. CASE; Professor
(E-mail: <ramesh.malla@uconn.edu>)
- Sachin Tripathi, PhD Student (E-mail: Sachin.Tripathi@uconn.edu)
- Celso de Oliveira, PhD Student (<celso_cruz.de_oliveira@uconn.edu>)

URL for Faculty research page: <https://cee.engr.uconn.edu/people/malla-ramesh-b>

Other Project Related Links:

- **UConn Engineering Announced as Partner Institution for \$14.2M Regional Transportation Center** <https://news.engr.uconn.edu/uconn-engineering-announced-as-partner-institution-for-14-2m-regional-transportation-center.php>
- **U.S. DOT Region 1 UTC – Transportation Infrastructure Durability Center (TDC)**
<https://www.tidc-utc.org>