INTERNSHIPS OFFER UNIVERSITY OF HOUSTON

Please find below the requested information for CESI internships at UH.

Dr. Kim Kinam, from the Construction Management Department, is delighted to offer the opportunity to supervise one student during the Fall 2025 semester (September - January). Below are some exciting topics he would be happy to explore with a student:

1. Workforce Development for Recruiting and Retaining People with Limited Mobility
    - Description: The construction industry is facing a shortage of skilled workers, which is compounded by the high rates of occupational injuries that lead to workers leaving the field. This research seeks to identify job positions that could be adapted with assistive and emerging technologies in both the construction and transportation industries, helping create a clear pathway for recruiting and retaining injured workers.
2. Interactive Human-Robot Collaboration in Construction
    - Description: This research investigates methods for promoting safety and improving productivity through collaboration between construction workers and robots. As we move toward fully automated construction, this collaborative approach will minimize hazards and enhance efficiency by using sensors to gather contextual information, ensuring safe and productive robot control.

Dr. Zia U Din from the Construction Management Department would be thrilled to supervise two students during the Fall semester (September to January). Below are a few thoughtfully proposed topics, which can be tailored to the students' interests and expertise:

1. Challenges of Worker Safety in Circular Economy Projects
    - Description: The adoption of circular economy practices in construction aims to reduce waste and environmental impact. However, the safety risks associated with handling reused materials and modular systems remain underexplored. This research aims to identify and address these safety challenges, offering insights to support safer industry adoption.
2. VR/AR-Enhanced Prevention through Design (PtD) Training
    - Description: Virtual and Augmented Reality present innovative tools to enhance Prevention through Design (PtD) training, simulating safety scenarios in immersive environments. This research will explore how these digital tools, including serious games and AR/VR applications, can transform safety education and training practices.
3. Automated Hazard Recognition and Risk Assessment
    - Description: By leveraging Artificial Intelligence (AI) and Machine Learning (ML), this research will analyze past OSHA injury reports to uncover common accident patterns. The goal is to predict hazards, equipment failures, and unsafe conditions, enabling proactive safety measures to prevent incidents before they occur.

Dr. Lu Gao is also excited to host a number of interns for the Fall 2025 semester, with the following proposed topics, which can be personalized to the students' specific interests and expertise:

1. AI Applications in Construction
2. AI Applications in Transportation

Dr. Konrad Krakowiak and Dr. Ahmed Senouci, from the Civil Engineering Department, are pleased to accommodate up to two students for research in SERC labs from June 2025 to October 2025. The proposed topics include:

1. Fire-Resistant High-Toughness Lightweight Cement Composites for Building Envelopes and Cladding Systems
2. Microstructure-Informed Mix Proportioning Development for Strength Optimization in Cement-Based Supercapacitors for Civil Infrastructure (in collaboration with MIT)
3. Concrete Upcycling and Recycling Strategies through CO2 Activation: Process Design and Life Cycle Assessment

Brief Project Descriptions:

1. This project aims to develop lightweight cement composites with high toughness and low thermal conductivity, ideal for building envelopes and cladding systems, enhancing fire protection in buildings, particularly single-family homes. The research will focus on microstructure optimization, mix design, and fire resistance of the materials, ultimately contributing to large-scale implementation of these solutions.
2. This research will focus on optimizing the strength of cementitious composites that also possess energy storage capabilities, similar to supercapacitors. In collaboration with MIT, the goal is to bridge the gap between structural concrete and energy storage materials, contributing to the future of multifunctional construction materials.
3. The upcycling of construction waste through CO2 activation holds significant promise for addressing a shortage of supplementary cementitious materials (SCMs) and reducing the carbon footprint of the construction industry. This project will examine how CO2-activated SCMs can impact the strength and durability of cement-based materials and perform a life cycle assessment to understand its environmental implications.