

## **Collaboration Statement**

I am excited about the opportunity to collaborate with Rice University's diverse and interdisciplinary research community to advance sustainable geotechnical solutions for urban infrastructure. My research focuses on developing advanced models for unsaturated fine-grained soils and eco-friendly soil stabilization techniques, which are critical for enhancing the resilience and sustainability of urban environments. I am particularly interested in working with experts across multiple departments and schools at Rice to leverage their knowledge and expertise, fostering innovative solutions that address the complex challenges posed by urbanization and climate change.

## **Potential Advisors and Collaborators**

### **1. Prof. Jamie Padgett** (Civil and Environmental Engineering)

- **Expertise:** Infrastructure resilience, risk assessment, and hazard mitigation.
- **Contribution:** Prof. Padgett's work on infrastructure resilience will be invaluable in integrating my soil stabilization techniques into broader urban infrastructure systems. Her insights into risk assessment and hazard mitigation will help ensure that these systems are robust and reliable under various environmental conditions.

### **2. Prof. Pedro J. J. Alvarez** (Civil and Environmental Engineering)

- **Expertise:** Environmental nanotechnology, sustainable water systems, and bioremediation.
- **Contribution:** Collaborating with Prof. Alvarez could lead to innovative approaches in eco-friendly soil stabilization methods, particularly in using nanomaterials and bioremediation techniques to enhance soil properties and manage groundwater resources effectively.

### **3. Prof. Richard Baraniuk** (Electrical and Computer Engineering)

- **Expertise:** Machine learning, data science, and signal processing.
- **Contribution:** Integrating machine learning techniques into my research on soil behavior modeling can significantly improve predictive accuracy and computational efficiency. Prof. Baraniuk's expertise will be crucial in developing advanced computational models that leverage large datasets for better soil behavior predictions.

### **4. Prof. Daniel Cohan** (Civil and Environmental Engineering)

- **Expertise:** Environmental sustainability, air quality modeling, and climate policy.
- **Contribution:** Prof. Cohan's work on environmental sustainability and policy provides a broader perspective on the environmental impact of

geotechnical practices. His guidance will help ensure that my research aligns with sustainable development goals and contributes to policy frameworks that promote environmental protection.

### **Planned Commitment to Collaboration**

My planned commitment to working with these research partners involves regular interdisciplinary meetings, collaborative research projects, and joint publications. I am keen to participate in seminars and workshops hosted by various departments to foster knowledge exchange and innovation. By integrating geotechnical engineering with environmental science, data science, and sustainability principles, I aim to develop holistic solutions that address the challenges posed by urbanization and climate change.

### **Specific Collaborative Plans:**

#### **1. Interdisciplinary Meetings:**

- Regular meetings with advisors and collaborators to discuss research progress, share insights, and explore new ideas.
- Integration of different disciplinary perspectives to refine research objectives and methodologies.

#### **2. Collaborative Research Projects:**

- Joint projects that combine expertise from different fields to address complex geotechnical challenges, such as the impact of soil stabilization on urban infrastructure resilience.
- Development of new, sustainable geotechnical practices through a blend of engineering, environmental science, and computational modeling.

#### **3. Joint Publications:**

- Co-authoring research papers with collaborators to disseminate findings and contribute to the academic community.
- Targeting high-impact journals and conferences to ensure wide dissemination and recognition of the research.

#### **4. Seminars and Workshops:**

- Active participation in interdisciplinary seminars, workshops, and conferences hosted by various departments to foster knowledge exchange and innovation.
- Presenting research findings and gaining feedback to further refine and enhance the research quality.

**5. Student Mentorship:**

- Mentoring undergraduate and graduate students across multiple disciplines, encouraging them to engage in interdisciplinary research and develop a holistic understanding of sustainability and resilience in geotechnical engineering.
- Involving students in collaborative projects to provide hands-on experience and foster future interdisciplinary researchers.

By collaborating with these esteemed faculty members and leveraging Rice University's resources, I aim to develop holistic solutions that enhance the sustainability and resilience of urban infrastructure. This interdisciplinary approach will not only advance my research but also contribute significantly to Rice University's mission of advancing knowledge and improving lives.