University of Colorado Boulder

Civil, Environmental and Architectural Engineering
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PhD Position in Socio-Physical Infrastructure Systems Resilience

Adaptive Socio-Physical Infrastructure Lab — Start: **Fall 2027**

Description:

The Adaptive Socio-Physical Infrastructure Lab is recruiting one PhD student to start in Fall 2027 in the Department of Civil, Environmental, and Architectural Engineering (CEAE) at the University of Colorado Boulder. The position is fully funded through a research assistantship.

We build computational and analytical methods that capture how societies, infrastructure, and environmental stressors interact across scales. Our focus is modeling engineered systems, quantifying uncertainty, informing decisions objectively, and reducing the societal impacts of infrastructure failures. The successful applicant will enroll in the CEAE PhD program in the Structural Engineering and Structural Mechanics track.

Research topics include:

- Reliability, risk, and resilience modeling, from single structures to infrastructure systems
- Uncertainty quantification across scales, including the uncertainty introduced by modeling choices
- Graph-theoretic, multifidelity, and machine learning methods for socio-physical infrastructure and natural hazards
- Smart and adaptive systems that update data, models, and decisions over time
- Informing decision-makers and policymakers to support long-term resilience and sustainability

Qualifications:

We are looking for curious, rigorous researchers who enjoy interdisciplinary work, with:

- A background in civil or structural engineering, industrial or systems engineering, statistics, applied mechanics, applied physics, or a related quantitative field;
- Comfort with, or eagerness to develop, probabilistic and computational skills;
- Openness to fieldwork;
- A master's degree (desirable); undergraduates with research experience are also encouraged to apply.

Applicants must also meet the admission requirements of the CEAE PhD program (details).

Application Process:

1. Apply to the CEAE PhD program by **Dec. 1** (international applicants) or **Dec. 15** (domestic applicants), following the CEAE application instructions.
2. Email raul.rincon@colorado.edu with the subject **"PhD Fall 2027 - LastName"**, your CV, and a short note on one or two research questions you would like to work on.

About:

The Adaptive Socio-Physical Infrastructure Lab: The lab develops computational and probabilistic methods to evaluate, design, and manage infrastructure systems exposed to deterioration, natural hazards, and climate stressors. These methods show how damage to physical systems reaches the people who depend on them, and help decision-makers choose interventions that keep urban infrastructure safe, resilient, and fair, now and into the future. The lab is led by Raul Rincon, who joins CEAE as Assistant Professor in Spring 2027. Students can expect substantive, regular mentoring, exposure to the full research lifecycle, professional skills development, and honest career conversations. More details: https://rinconraul.github.io/

The Department of Civil, Environmental, and Architectural Engineering (CEAE) at CU Boulder: University of Colorado Boulder is Colorado's flagship university, ranked as one of the top 10 public engineering graduate programs in the country, according to U.S. News and World Report's Best Graduate Schools list for 2026-27 (civil engineering graduate program ranked top 15 among public institutions). Located at the base of the Rocky Mountains, Boulder offers an exceptional setting for graduate study and life outside the lab.