



Postdoctoral Scholar Positions in Computational Modeling and Simulation

The NHRI SimCenter invites applications for four full-time Postdoctoral Scholar positions to support software development and computational simulation in the following focus areas:

Coastal Engineering and Hydrodynamics including modeling the impact of storm surge and tsunami hazards using large national datasets and hydrodynamic simulations; working with experimental data to model damage and debris generated by inundation and wave action on buildings and infrastructure components.

Machine Learning and Data Science including the application of data fusion, inference, and regression techniques to support the creation of large inventories of buildings, infrastructure components and systems, and population demographics from imperfect and incomplete data; application of machine learning techniques to replace expensive simulations with high-fidelity approximate models.

Multi-hazard Regional Risk Assessment including the application and benchmarking of natural hazard, structural response and performance models; the implementation and application of methods to simulate damage and performance of interdependent infrastructure systems; the development of testbeds for verification and validation of regional simulation workflows using large hazard, inventory, and reconnaissance datasets.

Socioeconomic Models and Recovery Simulation: including the implementation and application of models to simulate the post-disaster behavior of households, businesses, and service providers; working with large demographic and economic datasets.

The Computational Modeling and Simulation Center (SimCenter) is part of the Natural Hazards Engineering Research Infrastructure (NHRI) funded by the National Science Foundation. The SimCenter's team of researchers is headquartered at the Department of Civil and Environmental Engineering at the University of California, Berkeley, and collaborates with faculty and research groups from more than a dozen universities across the country. This broad and diverse team of experts in computational modeling accelerates progress in natural hazards engineering, disaster science, and risk mitigation through software development, collaboration, training, and education provided to researchers and practitioners. The promotion of a diverse, equitable, and inclusive workplace is a core value of the SimCenter, and we are interested in candidates who share this vision.

The Center is seeking self-motivated applicants with proven knowledge in natural hazards engineering (NHE) and related disciplines, scientific computing skills, and a desire to shape the next generation of disaster simulation tools and practices. Candidates are expected to work in the following three areas:

Development: Familiarize yourself with the SimCenter application framework, the supporting datasets, and the tools built on top of that foundation. You are expected to contribute to the framework by extending existing modules and implementing new ones using the Python and C++ languages. Duties span the entire lifecycle of software tool development, including conceptual design, implementation, documentation, and user support.

Collaboration: Proactively leverage the SimCenter's connections to faculty and research groups at various universities, governmental agencies, and companies and seek opportunities to participate in original research that promotes computational modeling in NHE. Collaboration activities include mentoring undergraduate students in the NHRI REU program and graduate student interns.

Engagement: Give online and in-person education and training events (webinars, bootcamps, tool trainings, etc.) and participate in conferences, workshops, and working group meetings to actively engage students, faculty, and practitioners and monitor the state of the art in research and practice.

Minimum requirements

- PhD with a strong background in one of the four focus areas noted above
- Computational methods development and programming skills
- Excellent written and oral communication skills

Desirable skills and experience

- Knowledge of Python, C++, Qt, High-performance and Cloud Computing
- Working experience with government agencies and the data they provide
- Experience working in a large team environment
- Familiarity with the SimCenter application framework and tools

Initial appointments will be for one year with the possibility of renewal up to September 30, 2025. Successful applicants will join the SimCenter team either at the Richmond Field Station at **UC Berkeley** or at the Blume Earthquake Engineering Center at **Stanford University**. The SimCenter offers competitive pay, commensurate with experience, and excellent benefits.

Application

Interested candidates should send the following materials in electronic form to nheri-simcenter@berkeley.edu:

- Curriculum Vitae, including academic and professional experience and publications.
- Cover letter, detailing interests, and envisioned contributions to the SimCenter as well as contributions to promoting diversity, equity, and inclusion. Candidates are encouraged to learn more about the SimCenter at <https://simcenter.designsafe-ci.org>.
- Unofficial transcript of academic records
- A copy of one representative publication by the candidate
- Contact information for three references

Application reviews will begin on **December 19, 2022** and will continue until the positions are filled. The desired start date for successful candidates is the first half of 2023.

The University of California is an equal opportunity affirmative action employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability, age, or protected veteran status. For the complete University of California nondiscrimination and affirmative action policy see: <https://policy.ucop.edu/doc/4000376/NondiscrimAffirmAct>.

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