

**Postdoctoral Research Associate  
in Problem Solving Environments**

**Computer Science and Engineering Division  
Computer and Computational Sciences Directorate  
Oak Ridge National Laboratory  
Oak Ridge, Tennessee**

**ORNL09-71-CSED**

**Project Description:**

The Modeling and Simulation (M&S) Group in the Computational Sciences & Engineering Division (CSED) at Oak Ridge National Laboratory (ORNL) seeks to hire an early-career software engineer researcher with a strong academic background necessary to contribute to the design and deployment of a new computational Problem Solving Environment (PSE) under development for the U.S. Nuclear Regulatory Commission (NRC) in the field of probabilistic fracture mechanics.

PSEs are computing environments that support the entire range of scientific computational problem-solving activities from problem formulation to algorithmic selection to simulation execution to solution visualization. PSEs support collaboration among researchers separated in time and space and provide access to a diverse set of resources that include computational codes and computing resources. PSEs should be capable of linking a heterogeneous mix of resources including people, computers, data, and information within a seamless integrated environment to solve a specific target class of problems. The target problem class under development at ORNL for the NRC is the probabilistic modeling of certain structures within a nuclear power reactor with the intent of performing a risk-informed assessment of the structural integrity of the reactor's pressure boundary.

ORNL is internationally known for its expertise in developing high-performance scientific computing applications. Candidates will be capable of integrating into the research team to enhance the Laboratory's growing research program to develop a fully-integrated PSE for safety assessments of nuclear power plants. The successful applicant will also be expected to participate in writing proposals and assist in developing additional sources of funding that support research and development work within the M&S Group. Good skills in communication and teamwork are required for an environment that will involve working with other team members and interaction with sponsors.

The M&S Group is actively involved in research for building, deploying, and managing PSEs across the entire software life cycle. The PSE will provide a set of user-friendly mechanisms and tools that allow the user to "compose" an application, by gluing together different building blocks based on a problem-specific language. Such modular building blocks range from libraries and application codes, to tools for I/O, data visualization and analysis, and interactive steering.

**Qualifications:**

The position requires a Ph.D. in Computer Engineering, Computer Science, or a closely related discipline. Candidates must have good communications skills and a strong desire to work in a team environment. A strong background in computer programming is a requirement and experience in object-oriented programming (Python, Java, C++, etc), procedural programming (C, Fortran 90/95, etc.), database management, Web 2.0 Python frameworks, version source code control, and distributed computing is desirable.

Applicants cannot have received the most recent degree more than five years prior to the date of application appointment and must complete all degree requirements before starting their appointment.

**Technical Questions:**

Contact B. Richard Bass at [bassbr@ornl.gov](mailto:bassbr@ornl.gov) . Please reference the position title and number when corresponding about this position.

**How to Apply:**

Qualified applicants may apply online at [https://www2.ornl.gov/ORNL\\_POST/](https://www2.ornl.gov/ORNL_POST/). All applicants will need to register before they can begin the online application. For complete instructions, on how to apply, please see the instructions at <http://www.ornl.gov/orise/edu/ornl/ornl-pdpm/application.htm>. When applying for this position, please reference the position title and number.

This appointment is offered through the ORNL Postgraduate Research Associates Program and is administered by Oak Ridge Associated Universities (ORAU). This appointment is open to all qualified U.S. citizens without regard to race, color, age, religion, sex, national origin, physical or mental disability, or status as a Vietnam-era veteran or disabled veteran.