Opportunity Title: ORNL Visualization for Scientific Software Development Post-Master's Research Associate

Opportunity Reference Code: ORNL17-52-CSMD

Organization	Oak Ridge National Laboratory (ORNL)
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Description Oak Ridge National Laboratory (ORNL) is the U.S. Department of Energy's largest science and energy laboratory tasked to provide the United States government agencies and departments with technology and expertise to support national and homeland security needs.

Our diverse capabilities span a broad range of scientific and engineering disciplines, enabling the Laboratory to explore fundamental science challenges and to carry out the research needed to accelerate the delivery of solutions to the marketplace.
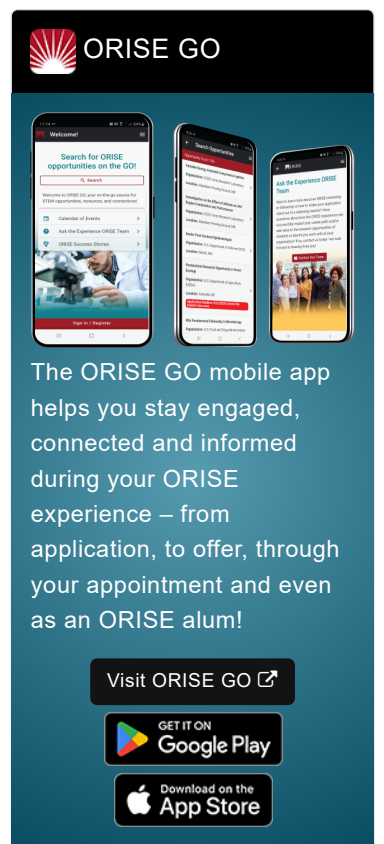
We invite applications for post-master's appointments in visualization development within the Computer Science and Mathematics Division.

This position is part of ORNL's Scientific Software Initiative, which provides scientific software development expertise to the Laboratory, by providing software engineering and development services across the Laboratory in a broad range of areas and topics. The Initiative supports the mission of the Laboratory by creating a community for software professionals at the Laboratory to connect people, projects, and interested parties; by providing software engineering expertise for development, evaluation, quality assurance or other needs; by providing training and continuing education opportunities; by providing fair performance evaluation criteria; by recruiting new software engineering talent; and by mentoring students and early career scientists and engineers.

The Initiative currently contributes to scientific computing projects in advanced materials, advanced manufacturing and 3D printing, astrophysics, batteries, neutron science, nuclear energy, and quantum computing. It also contributes to pure computer science projects. Initiative members are active in the open source community, including the Eclipse Foundation, and most Initiative projects are available on GitHub.com.

Job Duties and Responsibilities:

- Contribute to the development of visualization technologies as for the Eclipse Advanced Visualization Project (EAVP)

- 3D rendering with web-based technologies such as WebGL

- Visualization in web-based UI frameworks such as Vaadin

- Geometry and Mesh Editors

- Mesh visualization technologies, including VisIt and Paraview

- Basic plotting tools

- In-situ visualization

- Simultaneously contribute to software development activities and original research.

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The selected candidate will be nominated for, and receive committer status, on the EAVP project. Further information on the project can be found at https://www.eclipse.org/eavp and https://www.eclipse.org/ice.

Qualifications - A Master's degree in computer science or a related field with a background in visualization is required.

Preferred:

- Experience with software development methodologies, such as version control systems like Git and Subversion and knowledge of UML.

- Large-scale modeling and simulation for visualizing large data sets.

- Excellent communication and writing skills and the ability to work on a team in a dynamic group environment as the team meets daily, practices Continuous Integration, collaborates on the source code and has regular deadlines.

- Prior experience developing or contributing to large, complex software systems.

- Experience using multiple languages, including the following: C/C++, Java, JavaScript, Python. Applicants with experience only in Fortran 77/90 will not be considered.

- Experience in high-performance computing, especially, but not limited to hybrid MPI+OpenMP+CUDA environments.

- Activity within the broader open-source software community would be looked upon favorably, but is not required.

- Experience with modern graphics libraries like Direct3D, OpenGL, WebGL,

- Regular presentations or tutorials at relevant conferences.

- A track-record in developing detailed documentation in multiple formats and experience with documentation generation using tools like Javadoc and Doxygen.

An open-source code sample that may be used for evaluation purposes will be required later in the application process. Your code sample should be related in some way to the subject of this post. It should be object-oriented, contain five or more classes, show a sophisticated understanding of the project and be your sole work to a very high degree (>95%). Samples in Fortran are not acceptable. Ideally the code sample would be made available on GitHub or a similar sharing platform, although submissions by email are fine too.

UT-Battelle is recognized by our employees and the community as an inclusive environment where diversity is valued and individuals and teams are inspired to contribute fully to the organization's success. ORNL is an

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equal opportunity employer. All qualified applicants, including individuals with disabilities and protected veterans, are encouraged to apply.

The ORNL Postgraduate Research Associates Program is administered by Oak Ridge Associated Universities through its contract with the U.S. Department of Energy to manage the Oak Ridge Institute for Science and Education (ORISE).

Eligibility Requirements
- **Degree:** Master's Degree received within the last 60 month(s).
- **Academic Level(s):** Post-Master's.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12 👁)
  - **Communications and Graphics Design** (6 👁)
  - **Computer, Information, and Data Sciences** (16 👁)
  - **Earth and Geosciences** (21 👁)
  - **Engineering** (27 👁)
  - **Environmental and Marine Sciences** (14 👁)
  - **Life Health and Medical Sciences** (45 👁)
  - **Mathematics and Statistics** (10 👁)
  - **Physics** (16 👁)
  - **Science & Engineering-related** (1 👁)

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