MICHIGAN STATE
UNIVERSITY

Cloud Computing Software Engineer for Multi-Messenger Astrophysics

MSU's Institute for Cyber-Enabled Research and the MSU IceCube research group are hiring a software engineer to help develop a cloud-based platform to support time-domain data streams produced by several large-scale facilities observing different astronomical messenger particles, including the IceCube Neutrino Observatory, a kilometer-scale neutrino detector at the South Pole, gravitational wave detectors such as LIGO, and astronomical survey instruments such as LSST.

The goal of this position is to develop a distributed processing system that rapidly coordinates multi-messenger follow-up observations triggered by IceCube with existing observations and real-time surveys; to develop data analysis tools helping to correlate IceCube neutrino observations with other astronomical data such as gravitational wave, gamma-ray, and optical observations; and to develop interactive visualization and analysis tools to support these multi-messenger astronomical observations. This system will contribute to our understanding of the most energetic phenomena in the universe, from supernovae to merging black holes. This position will be part of the multi-institution SCIMMA project, and will involve collaboration with developers across multiple universities.

DUTIES AND RESPONSIBILITIES: In this position you will: design, develop, and deploy cloud-based services for handling astrophysical multi-messenger alert streams from IceCube, LIGO, LSST, and other observatories. Implement automated systems for deploying event brokers and managing distributed consumers in a cloud environment. Architect filtering, crossmatch and data analysis services. Design object-store based systems to enable bulk analysis of multi-terabyte alert archives. Develop, document, and extend data formats and develop conversion and analysis tools. Architect cloud-hosted JupyterLab data visualization environments to enable end-users to use the alert tools and investigate observations.

QUALIFICATIONS: Knowledge equivalent to that which normally would be acquired by completing a four year college degree program in Computer Engineering or Computer Science; three to five years of practical experience relating to designing, scheduling, implementing, debugging and testing of complex computer systems; or an equivalent combination of education and experience. Desired qualifications include some subset of: a Bachelor's degree or higher in computer science, physics, astronomy, or a related field; experience with collaborative software development; expertise in developing and deploying cloud and distributed services; effective written and oral communication skills; experience with Python, Java, and/or Scala; an interest in developing expertise in scientific computing software, real-time stream processing, and distributed databases.

APPLICATION MATERIALS: Resume, cover letter, names of three potential references.

SALARY STATEMENT: Commensurate with qualifications, anticipated to be $70K-$90K.

APPLICATIONS: Due May 7, 2020. Apply to job #634212 at careers.msu.edu. Late submissions will be considered if a suitable candidate pool is not identified by the deadline. MSU is an affirmative-action, equal-opportunity employer. MSU is committed to achieving excellence through cultural diversity. The university actively encourages applications and/or nominations of women, persons of color, veterans and persons with disabilities. Applicants who are not U.S. citizens or permanent residents must provide documentation evidencing employment authorization in the United States. Please contact Dr. Brian O'Shea at oshea@msu.edu for more information.

Office of the Vice President of Research and Graduate Studies

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