



Tara L. McQueen
Junior: Delaware State University
Major: Information Technology
Minor: Criminal Justice

Faculty Advisor: Jaiwant Mulik

Program:
Research Alliance in Math & Science

Email: mcqueent@ornl.gov
Home: skilledatsoccer@yahoo.com

Research Area: Computer Science and Mathematics

Application Performance Evaluation is indispensable on today's high-performance computing (HPC) platforms. In addition, the diversity of various parallel applications and their target platforms has also increased considerably. This diversity and the importance of performance evaluation have created a situation where user-productivity suffers each time a different mapping of application and platform necessities are required. Yet, the whole process of performance evaluation continues to be carried out manually.

In this project we propose an easy-to-use framework as part of our OSCAR cluster installation and management suite. The proposed framework would capture the essentials of the infrastructure needed in order to carry out a given performance evaluation experiment. The performance evaluation process mainly consists of the following: Preparing the required execution environment, starting a performance diagnostic/evaluation tool, executing of a given application, and processing/analyzing results.

Given the requirements of the performance evaluation process, our framework is intended to consist of the following stages: preprocessing, configuration, execution, data gathering/analysis, and cleanup. Furthermore, our framework is planned to be extensible so that various customizations can be plugged in effortlessly. An example situation in which our proposed framework can be effectively used: Running of a 16 node parallel HPCC benchmark application suite on virtual node configuration, with Oprofile as the performance diagnostic tool, with post-processing of the data on the L2 cache misses, and finally with the visualization view of cache-misses across kernel, user-space and hypervisor. The primary goal of this project is to improve the user-productivity when carrying out a full performance evaluation experiment.

Research Mentor:

Stephen L. Scott
Computer Science and Mathematics Division
Oak Ridge National Laboratory

(865) 574-3144
scottsl@ornl.gov