Undergraduate Research Assistants Program

Faculty supervisor: Prof. Jingbo Ye, x8-2114, yejb@physics.smu.edu

Student:
Requirement: knowledge of Linux, C++, and FORTRAN.
Start date of research: 8/31/2006
Wage: $10.00/hr.

Study on the Efficiencies of C++ and FORTRAN
in Scientific Computing on Popular Linux Platforms

I have immediate need for a student to carry out benchmark efficiency studies of C++ and FORTRAN in scientific computing on popular Linux platforms.

FORTRAN has been widely used in scientific computing, especially in High Energy Physics, for its high efficiency and ease of coding. C++ gains its popularity in scientific computing because of its modularity in coding and Object-Oriented programming philosophy that provides easy maintenance in large software packages. In High Energy Physics and in many other fields, there are still computing tasks that need a lot of CPU power (weeks to years of huge computing farms) there high efficiency languages sometimes outweigh the convenience of easy maintenance. So a dedicated study of the efficiency of the two popular languages on Linux platform is necessary.

The student researcher will search for previous results on the benchmark efficiencies of FORTRAN and C++. Write a summary. Based on this research, the student will write codes in both FORTRAN and C++ and compile them on Linux machines (will be provided), and then compare the time needed for the codes to perform the same tasks. Final write-up of this research work is required and publication will be encouraged.