SDSC Research Experience for High School Students (REHS)

Project Title: SDSC Sandbox Development Intern

Help us teach kids how to build a supercomputer.

Overall Research Project
The heart of the San Diego Supercomputer Center is making computers work in concert, and as networks become faster, multicore processor are the norm, and accelerators like GPUs and the Xeon Phi become more prevalent, the skills to make these elements work synchronously are critical. Right now, there are few course on parallel programming and distributed architecture at the undergraduate level and below, but the basic concepts aren’t difficult. We are looking for a small team of high school students to help us develop methods to prepare middle and high school students to use and program current hardware—and design future hardware that we haven’t imagined.

The potential teaching mechanisms are open-ended, and could include formal lecture or project-based classes, or an informal hacker space where kids can build according to their imagination, with experienced guides on hand to help. The ideal candidates for this internship will be students who love playing with technology, actively learning, and can reflect on how they went from inspiration to prototype. Interns will be given a few specific projects to complete, including documenting how to build a Linux cluster with Raspberry Pi computers and adapting tiled display software for the Raspberry Pi. No one is exceptional in everything, and the required and preferred skills will be balanced over the group of interns. Partnerships with existing student organizations are welcome.

Number of students to be supported: One or two.

Name of Lead Person: Dr. Rick Wagner, San Diego Supercomputer Center, UCSD

Plan to integrate the student into the group activity: The students will primarily reside at SDSC to be able to communicate with other participants of the program and the lead mentor. In addition, the students will have an opportunity to attend the group meetings at LIAI and School of Pharmacy and to directly communicate with the IEDB group members and the mentors.

Student Prerequisites:

Required
• Enthusiasm
• Familiarity with modern computer architecture (networking, processors, graphics)
• Programming experience • Excellent written and verbal communications

Preferred
• Teaching experience • Software development in C or Python • Prototyping with LEGO Bricks ©
• Teamwork • Linux

Number of hours the student(s) will be asked to work per week: 20 hours