

Undergraduate Student Research Opportunities at the San Diego Supercomputer Center, University of California San Diego

The San Diego Supercomputer Center (SDSC), an Organized Research Unit (ORU) at the University of California San Diego and a leader in data-intensive computing and cyberinfrastructure, has opportunities for two undergraduate students to work on software research projects. The software projects are related to a research grant funded by the National Science Foundation on the topic developing open science gateway computing environment. Stipends will be given to each student for their participation in the research project. Each project will be between six to eight months in duration. Each student will be provided a stipend of up to \$5000 in total. Description of the projects are given below. Interested students are requested to email Amit Majumdar (majumdar@sdsc.edu), Data Enabled Scientific Computing Division, with resume.

Project 1

The Neuroscience Gateway project (NSG – <http://www.nsgportal.org>) seeks an undergraduate student to develop software to coordinate a web-of-trust membership management system. A web-of-trust (https://en.wikipedia.org/wiki/Web_of_trust) is a decentralized trust system. NSG needs such a system to aid in the scalable vetting of new users. The student would use an existing cryptographic software package, such as GPG (https://en.wikipedia.org/wiki/GNU_Privacy_Guard) and build management tools around that package to allow users in the web-of-trust to approve new users. This must also integrate with the existing NSG Portal user management system. The management tools may consist of command line tools, webserver-based forms, email processors or other reasonable approaches. Keep in mind that end users will have a variety of different platforms and may not have deep knowledge of cryptographic software or programming in general. Skill with computer programming is essential. Knowledge of encryption concepts and software would be helpful. The student should be prepared to learn to code everything from backend server programs to frontend user interfaces.

Project 2

The Neuroscience Gateway project (NSG – <http://www.nsgportal.org>) seeks an undergraduate student to work on a software project that will utilize the Virtual Cluster (VC) capabilities provided by the Comet supercomputer (http://www.sdsc.edu/support/user_guides/comet.html). Comet's High Performance Computing Virtual Cluster is a new capability which is primarily intended for users who require both fine-grained control over their software stack and access to multiple nodes. The project will involve understanding how the NSG utilizes supercomputing clusters in its current form and how, in addition, VCs can be utilized by the NSG to provide new features not easily available via the current mode of operation of NSG.

Experience with programming languages and scripting languages is required. Students who have some experience or interest in system administration is preferred.