STUDENT INTERNSHIPS FOR SUMMER 2013
Naval Research Laboratory
Center for High Assurance Computer Systems
Washington, DC 20375

Topic Area: Formal Methods for Software Engineering

The Software Engineering Section of NRL's Center for High Assurance Computer Systems is offering student internships for Summer 2013. Several ongoing projects within the section, all in the general area of formal methods for the software engineering of critical systems, have positions available.

The objective of the section's research program is to develop formal, mathematically based methods, models, algorithms, theories, and tools supporting both the construction and analysis of software at different levels of abstraction from requirements through code. Applying such methods and tools is necessary in the development of high assurance software for systems – e.g., autonomous systems, weapons systems, and security devices – that must satisfy critical system properties such as safety, timing, fault tolerance, and security. Topics of current research include:

- compositional model-based techniques for software construction and analysis
- modeling and simulation of software systems
- scenario-based synthesis of software models
- construction and analysis of continuous & discrete timed models of cyber-physical systems
- combining models from different domains
- verification techniques and tools, including decision procedures and theorem proving
- techniques for relating assertions and contracts in source code to system properties
- mechanical generation of code assertions and contracts for reasoning about systems
- automatic code synthesis
- automatic test-case generation
- pre-compilation optimization of source code
- combination of artificial intelligence and cognitive science with formal methods
- assurance of human trust in autonomous systems

Many of the formal methods based techniques and tools produced in our past research have been applied to real Navy systems.

U.S. citizenship is required. Applications for Summer 2013 internships **MUST** be submitted via the USAJOBS website (http://www.usajobs.gov) to the NRL Pathways Internship Program during the three day vacancy announcement period currently scheduled for 12-14 February 2013 (subject to change). **Interested students are encouraged to establish their USAJOBS account, prepare their resume, and upload unofficial copies of their transcripts in advance to facilitate application to the NRL Pathways Internship Program during the vacancy announcement period.** Additional details about the NRL Pathways Internship Program and application process can be found at http://hroffice.nrl.navy.mil/student/PathwaysIP.htm. It is also highly recommended that students contact either Dr. Myla Archer (myla.archer@nrl.navy.mil) or Dr. Elizabeth Leonard (elizabeth.leonard@nrl.navy.mil) to register their interest in the Section's internships. This will allow Drs. Archer and Leonard to keep interested students apprised of changes in the application process (e.g., dates of vacancy announcement) as they arise.