

**Posting Title:** Computer Scientist

**Job #:** 009365

**Posted Date:** 09/15/2010

**Job Title:** Science & Engineering MTS 2 (SES.2) / Science & Engineering MTS 3 (SES.3)

**Job Term:** Flexible Term

**Salary Range:** \$5867 - \$14266

**Organization:** 9817 Global Security Computing

**Directorate:** Computation

NOTE: This requisition has multiple openings; these are Flexible Term (at will) appointment, not to exceed six years. Lab employees and external candidates may be considered for this position. If final candidate is an Indefinite Career employee, Indefinite Career status will be maintained.

#### **NATURE AND SCOPE OF JOB**

The Global Security Computing Applications Division (GS-CAD) within the Computing Applications and Research Department has openings for computer scientists to work on the Embedded Computing Program's "Persistics" project team to develop algorithms and software tools for their scalable aerial surveillance video processing pipeline. Persistics is a collaborative effort involving multiple Department of Defense (DoD) partners that leverages research in advanced image stabilization, high fidelity moving object segmentation, representation and compression, and efficient large format data processing utilizing the most advanced techniques in efficient out-of-core stream based computation. Selected candidates will develop expertise with respect to heterogeneous multi-core processing on Graphics Processing Unit (GPU) and cellbased clusters. Will work closely with external research and engineering teams; internal interactions will be with team members, peers, project leadership, and program management, as needed. Will have occasional travel to customer sites.

Will report administratively to GS-CAD's NP Support Group Leader and programmatically to the Embedded Computing Program Leader.

#### **IN ADDITION AT THE SES.3 LEVEL**

Will work independently, as a technical expert on a multi-disciplinary team. Will initiate efforts to solve complex issues not previously addressed. Will discover, design, develop, debug, and deploy highly advanced software solutions. Will interact with professional colleagues, mid-level management, and sponsors across and external to the Laboratory. Decisions and activities may determine success of the project or task.

## ESSENTIAL DUTIES

- Define solutions that will meet project and sponsor needs working with LLNL programs.
- Explore existing solutions and identify approaches relevant to Persistics, including related DoD, DOE's NA-22, and LLNL's LDRD and Tech-base efforts.
- Design, implement, and deploy prototype systems that demonstrate the application of the Scalable Persistent Surveillance processing pipeline to problems of Laboratory interest.
- Remain current on the state of the art in image and video processing, 3D extraction from video, Geospatial Validation and Verification, out-of-core stream-based computation, and heterogeneous multi-core processing.
- Present detailed analyses of pipeline performance relative to final data products and processing both within LLNL and to external communities.
- Transition prototypes to use in customer applications in collaboration with the customers.
- Perform all assignments in accordance with ES&H, Security, and business practice requirements and policies.

## IN ADDITION AT THE SES.3 LEVEL

- Initiate efforts to solve complex issues not previously addressed.
- Discover, design, develop, debug, and deploy highly advanced software solutions.
- Mentor other personnel and assist in recruiting efforts.
- Act as technical resource to team members and lead technical teams.
- Deliver formal technical presentations.
- Write research proposals for complementary funding.

## ESSENTIAL SKILLS, KNOWLEDGE AND ABILITIES

- B.S. in Computer Science, Engineering, or Mathematics, or equivalent level of demonstrated knowledge.
- Experience in algorithm development for signal, image, and video processing applications.
- Familiarity with developing software applications in Linux, UNIX, and Windows environments.
- Experience with distributed and parallel computing.
- Experience developing and documenting software designs, implement code, develop and document test plans, and disseminate results.
- Familiarity Knowledge of a wide variety of programming languages such as C++, C, Python, Lua, Matlab, IDL, and Perl.
- Effective verbal and written communication skills along with strong analytical, organizational, and interpersonal skills.
- Demonstrated ability to work independently and implement research concepts in a multi-disciplinary team environment, where commitments and deadlines are important to project success.
- Demonstrated ability to effectively communicate technical information, document work, and prepare and present research papers.

## IN ADDITION AT THE SES.3 LEVEL

- Significant experience with demonstrated expertise in the above technical languages, concepts, or constructs.
- Advanced interpersonal, verbal, and written communication skills necessary to effectively collaborate in a team environment, and to present and explain technical information and provide advice to management.

## DESIRED SKILLS, KNOWLEDGE AND ABILITIES

- M.S./Ph.D. in Computer Science, Engineering, Mathematics, or related discipline.
- Familiarity with 3D extraction from video, optical flow and object motion tracking, wavelet compression and entropy coding, progressive hierarchy data layout and out-of-core stream processing, heterogeneous multi-core processing, machine learning, machine vision, and computational statistics.
- Visualization experience for large-scale imagery.
- Real-time image processing experience.
- Experience programming on commodity architectures such as GPUs or Cell Broadband Engines (CBE).
- Experience working with customers to define, refine, and implement programmatic requirements and milestones.
- Experience developing complex software solutions.
- Experience with Systems Engineering.
- Familiarity with data management systems.
- Ability to travel to sponsor sites.

## SPECIAL REQUIREMENTS:

Pre-Placement Medical Exam: A job-related pre-placement medical examination may be required.

Pre-Employment Drug Test: External applicant(s) selected for this position will be required to pass a post-offer, preemployment drug test.

Anticipated Clearance Level: Q, SCI. (Position will be cleared to this level).

Applicants selected will be subject to a federal background investigation and must meet eligibility requirements for access to classified information or matter. In addition, all L or Q cleared employees are subject to random drug testing.