Position Title: Senior Systems Software Engineer
Organizational Unit: Center for Imaging Science
FLSA Status: Exempt

**BASIC FUNCTION:**

In support of CIS missions, a Senior Systems Software Engineer provides expert software design, development, and system support. This includes design preparation and presentation, code development, documentation preparation, web development, unit testing, and software debugging. A Senior Systems Software Engineer combines a solid software development or computer science expertise with a comprehensive understanding of the projects and missions to ensure that software support and development are valid and efficiently managed. A senior systems software engineer may perform work assignments associated with design or development of specific software system components and subsystems. A senior systems software engineer provides planning, direction, and technical direction for software projects, and provides mentorship to more junior software engineers including students.

**MINIMUM QUALIFICATIONS**

• Substitution of relevant education or experience for stated qualifications may be considered.

*Knowledge, Skills, and Abilities:*

- Expert knowledge of software development techniques and practices.
- Fluent technical knowledge of the major CIS operational subsystems in specific area of expertise and working knowledge of the scientific application of those systems.
- Fluent knowledge of at least two high level languages (e.g. FORTRAN, C, C++, or Java).
- Fluent level of proficiency in a computer operating system such as NT, Unix, or VMS.
- Fluent knowledge of software support products such as text editors, debuggers, or email.
- Fluent knowledge of programmatic aspects of software design and development (cost, integration and testing, and schedule, resource estimation and project planning).
- Excellent verbal and written communication skills.
- Fluent mentoring and/or teaching ability.
- Demonstrated ability to establish and maintain effective working relationships with users, vendors, and outside contracts.
- Demonstrated ability to work in a team and to establish and maintain effective professional working relationships with peers across disciplines.
- Proven technical leadership in software development activities.
- Fluent knowledge in at least two of the following areas and Expert knowledge in 3 areas:
  ♦ Any physical science (e.g., physics, imaging science, chemistry, color science, etc.), mathematics, or engineering discipline
  ♦ Compiler design
  ♦ Operating and network system design
  ♦ Distributed processing/computing
  ♦ Client/server protocols
  ♦ OO development methodologies
  ♦ Scripting languages
  ♦ Configuration Management
  ♦ Algorithm design
  ♦ Relational/ OO database technology
  ♦ Data structure selection
  ♦ Software Testing Methodologies
  ♦ Artificial Intelligence
  ♦ Graphical User Interfaces
  ♦ Web application development
Education
- One of the following:
  - University Degree in Computer Science, Physics, Math, Engineering or technically related field (masters degree preferred).
  - Completion of an advanced software development license program.

Experience
- Minimum of 8 years experience in medium to large software systems development and design projects. Experience coordinating work of peers.

Duties and Responsibilities*
* See annual performance goals and objectives for complete list

A Senior Systems Software Engineer will make modifications and enhancements to very large and technically complex software systems. To support this effort, a senior systems software engineer will:
- Determine the effort and time that will be required to resolve assigned tasks.
- Lead the design or participate in the design of software modifications or enhancements. This includes usage of good design practices, documentation, and presentation of design reviews.
- Complete assigned development tasks in an accurate, robust, well documented (code, user info, test info), well tested (on multiple platforms) manner according to a defined schedule.
- Organize code reviews; reviews include software changes, test plans, user release notes, and any other pertinent information. Support code reviews of peers; document these efforts with details of findings.
- Keep the project lead appraised of any problems or schedule slips as soon as they are apparent.
- Develop new regression tests for new software that is developed.
- Follow all defined guidelines for software development/maintenance and deliveries.
- Interact with customers to ascertain specifications and performance standards of desire systems and create a proposal to meet the customer’s needs.
- Maintain state-of-the-art knowledge in software development, computer science and/or hardware systems expertise area.
- Investigate, analyze and share knowledge of new and/or pertinent software engineering methodologies and tools.
- Assist with development of proposals and acquisition of new business.
- Develop and present new technical concepts to mission leaders.
- Identify requirements, perform feasibility studies and vendor surveys for team compute hardware needs.
- Attend staff meetings as required and perform other related duties.
- Document work through design specifications, and engineering reports, and as appropriate, through published journal and proceeding papers.
- Guide and mentor more junior software engineers and computer scientists to promote skill growth.
- Participate as a member in professional society or organization as appropriate.

Definitions:
A **basic** level of expertise can be accomplished through the successful completion of a course in a specific area or a curriculum in a general field. This level would be assigned to someone who understands the basic topics, principles or practices within an area but has not practiced these principles in a non-class environment.

A **working** level of expertise can be accomplished through the successful completion of a curriculum in an area. This level would be assigned to someone who understands complex topics, principles or practices within an area but has not practiced these principles in a non-class environment.

A **fluent** level of expertise would be assigned to someone who understands the complex topics, principles or practices of an area and has demonstrated their competency through the completion of a small number
(e.g. 3-4) of medium-sized to large-sized projects in a formal development environment.

An **expert** level would be assigned to someone who has a thorough understanding of topics, principles or practices in an area and has demonstrated their competency through the completion of a number (e.g. 8-10) of medium-sized to large-sized projects in a formal development environment.

A **demonstrated** skill indicates that a person has successfully completed this skill but there is some risk that the same result will not occur for the next opportunity.

A **proven** skill indicates that a person has successfully completed this skill often or with sufficient quality that it is expected that the same successful result will occur for the next opportunity.