



## Job Description

**Job Title:** Senior Research Engineer - Software  
**Department:** Applied Research  
**Reports to:** Manager, Applied Research

### **Primary Function of Position:**

Intuitive Surgical designs and manufactures highly complex robotic systems for use in surgery. This position offers an opportunity for a candidate with exceptional software development skills to work on projects ranging from blue-sky research to those ready for transition to product development groups. A successful candidate will be equally comfortable leading architecture development and producing high-quality implementations that lend themselves to re-use, testing, and productization. He or she must excel in a high-energy small focused team environment, must have excellent communication skills and must be able to balance independent production of results with the need to collaborate during planning, system integration, and testing of larger projects. The ability to learn rapidly, as well as to drive to creative—yet practical—solutions from rough requirements are essential in this position. The candidate will work closely with other members of the Applied Research Group and several product development groups on product concepts, implementation, and systems integration. A strong sense of shared responsibility and shared reward is required, as is the ability to make work fun and interesting.

### **Roles and Responsibilities:**

This position has responsibility and authority for:

- Working on a cross-functional research team to design, develop, and integrate new user interface, image guidance, and control systems concepts for Intuitive's surgical robotic platforms.
- Contribute to multiple areas of software development for the implementation of high quality research prototypes used to evaluate new product concepts, including but not limited to the following areas:
  - User interface development.
  - Medical image processing and surgical navigation.
  - Machine vision.
  - Servo/motor hardware control and monitoring.
- Exploring clinical needs and participating in the development of requirements for addressing such needs.
- Completing early stage research and proof-of-concept work to establish technical feasibility and clinical value. This will include rapid iterations of prototype development and evaluation.

- Helping to establish, and then own, a coherent software architecture vision for the Applied Research Group.
- Applying this software architecture vision to support the extension of software libraries for research and development.
- Owning maintenance of software repositories for research activities.
- Developing software implementations that adhere to the Intuitive Surgical's software coding standards and good software development practices (unit testability, source code control, etc.).
- Building applications and infrastructure that are extensible and robust while working in small teams.
- Creating white papers and documentation for software architecture(s) and libraries.
- Working with, and supporting, external research partners and collaborators.

### **Skill/Job Requirements:**

Competency is based on: education, training, skills and experience. In order to adequately perform the responsibilities of this position the individual must have:

- A degree in Software, Electrical, or Computer Engineering, or related fields. A graduate degree is preferred.
- Minimum 8 years experience in software development.
- Three to five (3-5) years, or more, of industrial experience with demonstrated proficiency at the development of commercial-quality software architectures and implementations.
- Proven ability to identify new technologies and principles, to rapidly develop product concepts based on such technologies, within an applied research role.
- Demonstrated expertise in one or more of the following areas, with ability to grow into new areas: user interfaces, computer graphics, real-time signal processing and control frameworks. Well versed in medical image processing (2D, 3D), image registration, segmentation, and classification techniques as well as algorithms for filtering, pattern classification, feature extraction and quantification. Knowledge and experience with robotic and mechatronic systems is particularly desirable.
- Experience with medical imaging systems, with knowledge of DICOM formats and experience with medical image processing and image-guided surgery.
- Excellent C/C++ skills. Experience with Matlab. Experience with UI frameworks (e.g., Qt) and OpenGL. Experience with image processing libraries and toolkits such as IPP, OpenCV, ITK, VTK.
- Strong analytical skills.
- Proficiency in all phases of the development lifecycle including design, implementation, debug, verification, validations, and transfer.
- An interest in the medical applications of robotics, with the ability to view surgical procedures and medical images.
- Hands-on engineering experience with proven ability to work well in a team environment.
- Excellent communication and documentation skills.
- A real excitement to learn and get to the bottom of tough technical problems.
- Solid intellectual property management practices.

### **CONTACT:**

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