Systems and Software Engineering in a High Maturity Organization

Southwest Research Institute (SwRI®) is a recognized leader in applied computer science and systems engineering. With more than 30 years experience, the Automation and Data Systems Division at SwRI conducts systems and software engineering projects in accordance with two quality management systems, ISO 13485 for the design of medical devices and Level 5 of the Capability Maturity Model Integration (CMMI®) developed by the Software Engineering Institute (SEI) at Carnegie Mellon University. Additionally, many of our senior staff are certified Project Management Professionals (PMP®) by the Project Management Institute (PMI®).

SwRI employs a multifaceted approach to problem solving to develop customized, high-quality software to meet industrial and governmental needs. Combining outstanding technical capabilities with proven project management techniques, software development projects range from decision support systems to technical engineering applications.

SwRI develops software using a wide variety of programming languages — from assembly to high-level languages such as C++, C# and Java, as well as languages targeted for specific applications such as simulation. Development and target computer platforms range from embedded microprocessors to mainframes, workstations and personal computers.

Services

- Business process modeling and re-engineering
- System definition/requirements analysis
- Software specification development
- Rapid prototyping
- Software development and test
- System integration
- System acceptance test plan development
- Independent verification and validation
- Turnkey system development

Applications

- Automation
- Biomedical engineering
- Decision support systems
- Information systems across a broad spectrum of industries
- Intelligent transportation and intelligent vehicles systems
- Modeling and simulation

Technologies

- Client server architectures
- Computer networking
- Database/data warehouse technology
- Embedded systems
- Enterprise security technologies
- Graphical user interfaces
- Object-oriented technologies
- Operating systems
- Programming languages
- Service-oriented architectures
- Visualization

State-of-the-art optical microscopy equipment is used to perform long-term live-cell imaging for basic biological research and such applications as cancer diagnosis and tissue engineering.

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The SwRI-developed computerized physician order entry user interface applies innovative parsing and feedback technology to automatically interpret text into electronic format, resulting in an efficient prescription process.
Proven Project Management Approaches

- Business development and proposal development
- Project planning
- Cost estimating
- Project monitoring and control
- Risk management

Disciplined Engineering Methodology

- Engineering planning
- Software lifecycle selection
- Requirements development and management
- Analysis and design
- Implementation and unit test
- Integration and integration test
- End-user documentation
- Acceptance test
- Delivery and support

Support Processes

- Reviews (peer reviews, management reviews, client reviews)
- Configuration management
- Measurement and analysis
- Root cause analysis and decision support
- Quality assurance
- Training

SwRI has developed this spinal implant for a medical device company, resulting in more than 20 patent applications and FDA 510K approval.
SwRI's Automation and Data Systems Division is committed to reliably producing the highest quality work through a proven systems engineering process. Commitment to excellence is evident through the appraised attainment of Level 5 within the Software Engineering Institute's Capability Maturity Model Integration (CMMI®). This distinction is held only by a small number of American companies and even fewer applied research and development institutions.

Southwest Research Institute, an independent, nonprofit applied engineering and physical sciences research and development organization with 11 technical divisions, uses multidisciplinary approaches to problem solving. The Institute occupies more than 1,200 acres in San Antonio, Texas, and provides more than 2 million square feet of laboratories, test facilities, workshops and offices for nearly 3,300 employees who perform contract work for industry and government clients.

We welcome your inquiries.
For additional information, please contact:

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