



Creating Total Solutions

The University of Dayton Research Institute's (UDRI) Software Systems Group (SSG) creates total solutions in hardware, software, and algorithms. We are experienced in many areas, including interoperability, situational awareness, next generation manufacturing, high performance computing, sensors, and cyber security.

Interoperability. SSG developed the Open Standard for Unattended Sensors (OSUS), a development architecture that enables advances in sensor interoperability. OSUS allows any sensors using standard interfaces to connect to a network and move data across a common sensor grid.

Situational Awareness. SSG used the OSUS platform to develop Footprint™, a powerful, flexible, mobile, and scalable web-based situational awareness product that aggregates, analyzes, and monitors situation- and/or crime-related data. Footprint combines unique data formats, video monitoring systems, and other sensors into one operating picture.

Next Generation Manufacturing. SSG is investigating methods for using sensors to improve the manufacturing process. We are evaluating the accuracy of tool positioning systems and researching how to use and improve thermal imaging sensors. We discover sensing methods that allow robots to perform tasks normally done by humans, research how automated endoscopic technology can improve parts inspection and measurement, and find other ways to automate inspection.

Cloud/High Throughput Computing. SSG is one of 40 Microsoft® Metro Azure® members and the only academic institution in this group. We built one of the first hybrid High Performance Computing clusters with Field Programmable Gate Arrays, General-Purpose Computation on Graphics Processing Units, and Intel® cores all using the same motherboard backplane.

Sensors. SSG builds sensor solutions integrating Geographic Information Systems, Wide Area Systems, Wide Area Augmentation Systems, Unmanned Aircraft Systems, and web technologies. We understand the challenges around compression, orthorectification, and Cropland Data Layers (CDLs).

Cyber Security. SSG develops cyber solutions and helps clients move them through the Certification and Accreditation process for operational approval. We build expertise around network and solution security.

INTEROPERABILITY



SITUATIONAL AWARENESS



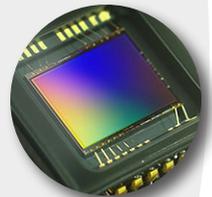
NEXT GENERATION MANUFACTURING



HIGH PERFORMANCE COMPUTING



SENSOR SYSTEMS



CYBER SECURITY



PROJECT QUALITY



SOFTWARE QUALITY



SOFTWARE ENGINEERING





How We Operate

SSG delivers software in two- to four-week increments or “sprints,” after which we revisit and re-align requirements and design. We believe constant customer interaction delivers what our clients want. In addition, we follow a Test Driven Design (TDD) development process—the “test then code” approach. We construct the test and follow with implementation.

True Software Engineering. SSG uses a true Agile development process in a TDD pattern using Model View Control (MVC) architecture. We use continuous integrations with automatic builds and testing, code coverage, style checkers, and code reviews. This process divides the work into sizable tasks and delivers high quality, functional, fully tested products. We build solutions across multiple platforms, using multiple programming languages and as much open source as possible.

Project Quality Management. SSG follows the SCRUM methodology and uses industry tools to track development progress. We meet daily for accountability and problem resolution; track bugs, tasks, and team member progress; manage documentation; hold manually scripted tests and document reviews; and review and approve code before moving it to the main code base.

Software Quality Management. Besides using Agile and TDD development practices, we employ industry standards and tools. We also follow Software Configuration Management (SCM) best practices to ensure code quality.

SSG Workforce

SSG’s workforce is a strong mix of industry leaders and young talent. Through our Work-to-School™ program, we hire advanced university students into full-time employment as they continue their education. Our student employees receive status checks, code reviews, automated testing and builds, and daily client interaction to ensure transparency and accountability. Each team member produces high quality code in this process.



Work-to-School not only develops software engineers with real-world experience, but also provides affordable software services with visible and measurable progress and results. Work-to-School is better than offshoring—local outsourcing means easier collaboration, ability to associate names with faces, potential for 24x7 support, and cost-competitiveness.

Contact Us. UDRI can tailor solutions to meet your needs. As experienced systems integrators, we can support or lead all phases of technology development from requirements definition to preliminary and detailed design, analysis, prototyping, testing, transition, and training. As a not-for-profit institution and objective third party, UDRI does not manufacture its own products or have a stake in a specific technology solution. We maintain a progressive attitude toward intellectual property rights and publication restrictions. Customers find it easy to work with UDRI due to our flexible and expedient contracting approach. Contact us today to learn more about how we can help you.

