

SOFTWARE SOLUTIONS SYMPOSIUM 2017

March 20–23, 2017 | Arlington, Virginia

KEYNOTE SPEAKERS

- J. Michael Gilmore, Operational Test & Evaluation, U.S. Department of Defense
- The Honorable Heidi Shyu
- James F. Geurts, U.S. Special Command (SOCOM)
- Harry Lee, U.S. Census Bureau

TUTORIALS

- Technical Debt
- Software Security and Secure Coding
- Requirements Engineering
- Cost Estimation
- Development, Testing, and Measurement
- Virtual Integration
- Implementing Agile in Government
- ...and more



What Is the Software Solutions Symposium?

Software for Capability, Agility, and Resilience

We all depend on software. In industry and government—and especially in the Department of Defense—software bears the responsibility every time a system gains a new capability. More and more, we have to balance the rapid evolution of systems and the development of increasingly complex capabilities with the need to modernize and sustain aging software systems. We know agility is a must, yet it can't come at the expense of security and resilience.

Building on the success of an inaugural event held in 2015, the Software Solutions Symposium will provide information on emerging technologies and technical strategies for software-reliant systems.

Senior researchers and practitioners who have spent years successfully developing and maintaining the most complex systems and software for industry and government programs will join together to offer half-day tutorials, talks, and panel discussions.

The symposium also provides a forum for networking and participation outside of formal sessions. You can share the challenges that keep you up at night, hear from others who've been there, and influence the SEI research agenda.

Highlights of the technical program...

- Using modeling to make costs, bug removal, and the impact of software on systems acquisition more predictable
- Understanding security risks, including those in embedded software, cyber-physical systems, and software supply chains
- Gathering requirements when your stakeholders are spread across programs, industries, or even the globe
- Developing a workforce for an anticipated 1.2 million unfilled cybersecurity jobs
- Learning how mobile devices can be made secure and reliable on the battlefield
- Implementing Agile in a variety of contexts, including technical reviews, evolutionary architectures, and data governance
- Evaluating cloud service providers
- Implementing security practices in DevOps
- Learning from real-life software implementations, including the Census Bureau's move to enterprise data management and the FBI's adoption of Agile



Registration

Pricing/Discount Options	Full Registration (Symposium +4 Tutorials)	Symposium Only (March 21–22)	Half-day Tutorials (March 20 & 23)
Standard Registration	\$1250	\$550	\$225/each
Government Organization	\$375	\$165	\$67.50/each
Small Business	\$937.50	\$412.50	\$168.75/each
Academic	\$875	\$385	\$157.50/each

Government pricing

Eligibility for the government rate for military personnel and government employees is confirmed by the use of a valid email address ending in .gov or .mil during the registration process. You must present a government-issued photo ID at check-in to receive your registration materials.

Small business pricing

To determine eligibility for the small business discount, we use the Small Business Association definition: the business must have no more than 500 employees for most manufacturing and mining industries, and no more than \$7 million in average annual receipts for most nonmanufacturing industries.

Academic pricing

Professors and researchers at academic institutions receive a 30% discount on the standard symposium registration fee and discounted tutorial fees. Eligibility for the academic rate is confirmed by the use of a valid email address ending in .edu during the registration process.

Professors, researchers, and students at academic institutions *affiliated with the U.S. Department of Defense* receive free symposium and tutorial registration. Eligibility for this rate is confirmed by the use of a valid institutional email address. Please use the promotional code **DOD100** when registering.

Student discounts

Students at accredited academic institutions receive a 50% discount on full-symposium registration and, subject to availability, registration for tutorials. To use this discount, you must provide proof of current enrollment with full-time status at an accredited institution in advance of the symposium and present your student ID at check-in to receive your registration materials.

Group pricing

If your organization has 3 or more registrants, contact us at info@sei.cmu.edu to receive a group discount code that will give you 15% off symposium and tutorial registration.

This pricing can apply to all registration paths: government, academic, small business, student, and standard.

For those who do not fit into one of the discount categories, please use the discount code ADV15 to receive a 15% discount on the standard full-symposium and tutorial fee at registration.

REGISTER NOW! sei.cmu.edu/ss/2017/registration.cfm



Keynote Speakers



**J. Michael Gilmore, Director,
Operational Test & Evaluation,
U.S. Department of Defense**

Tuesday, March 21, 8:30–9:15

Dr. J. Michael Gilmore was sworn in as director of Operational Test and Evaluation on September 23, 2009. A Presidential appointee confirmed by the United States Senate, he served as the senior advisor to the Secretary of Defense on operational and live fire test and evaluation of Department of Defense weapon systems.

Prior to his appointment, Dr. Gilmore was the assistant director for National Security at the Congressional Budget Office (CBO). In this position, he was responsible for CBO's National Security Division, which performs analyses of major policy and program issues in national defense, international affairs, and veterans' affairs. Specific areas

of investigation included the long-term implications of current defense policies and programs, the implications of transformation for equipping and operating U.S. military forces, the effectiveness and costs of alternative approaches to modernizing U.S. military forces, and the resource demands associated with operating and supporting U.S. military forces.

A native of Ohio and resident of Virginia, Dr. Gilmore is a graduate of The Massachusetts Institute of Technology, Cambridge, Massachusetts, where he earned a BS in physics. He subsequently earned a MS and PhD in nuclear engineering from the University of Wisconsin in Madison, Wisconsin.



The Honorable Heidi Shyu

Tuesday, March 21, 1:45–2:30

The Honorable Heidi Shyu is on the board of trustees for Aerospace Corporation. She was the Assistant Secretary of the Army for Acquisition, Logistics and Technology, ASA (ALT) from September 2012 to January 2016. Previously she served as the acting ASA (ALT) and the principal deputy.

As the ASA (ALT), she served as the Army acquisition executive, the senior procurement executive, the science advisor to the Secretary of the Army, and the Army's senior research and development official. She had principal responsibility for all department of the Army matters related to logistics.

Prior to this position, she was the VP of Technology Strategy for Raytheon Company's Space and Airborne Systems. She also held several senior leadership positions there, including corporate VP of Technology and Research, VP and technical director of Space and Airborne Systems, VP of Unmanned and Reconnaissance Systems, senior director of Unmanned Combat Vehicles, and Senior Director of Joint Strike Fighter.

In addition to her extensive experience at Raytheon, she served as a project manager at Litton Industries and was the principal engineer for the Joint STARS Self Defense Study at Grumman. She began her career at the Hughes Aircraft Company.

She holds a Bachelor of Science in Mathematics from the University of New Brunswick in Canada, a Master of Science in Mathematics from the University of Toronto, a Master of Science in System Science (electrical engineering) from the University of California, Los Angeles (UCLA), and an Engineer degree from UCLA. She is also a graduate of the UCLA Executive Management Program and the University of Chicago Business Leadership Program.

A member of the Air Force Scientific Advisory Board from 2000 to 2010, she served as the vice chairman from 2003 to 2005 and as chairman from 2005 to 2008. She was the ex officio on the Defense Science Board from 2005 to 2008.

Hon. Shyu is the recipient of the DoD Medal for Distinguished Public Service, Department of the Army Medal for Distinguished Civilian Service, Department of the Air Force Decoration for Exceptional Civilian Service, General Brehon B. Somerville Medal of Excellence, the Knowlton Award from Military Intelligence Corporation, National Infantry Association Order of Saint Maurice, Army Aviation Association's The Knight of the Honorable Order of Saint Michael, UCLA Engineering Alumni Professional Achievement Award, Raytheon Hero Award, University of Toronto Fellowship, New Brunswick Post-Graduate Scholarship, and the N. Myles Brown Science Award.



James F. Geurts, Acquisition Executive, U.S. Special Operations Command (SOCOM)

Wednesday, March 22, 8:15–9:00

Mr. James F. Geurts, a member of the Senior Executive Service, is acquisition executive, U.S. Special Operations Command, MacDill Air Force Base, Florida. He is responsible for all special operations forces acquisition, technology, and logistics.

Mr. Geurts, a native of Charleston, South Carolina, entered the Air Force in 1987 as a distinguished graduate from the Lehigh University ROTC program, where he earned a Bachelor of Science in Electrical Engineering. He has served as an acquisition program manager with engineering and program management leadership positions in numerous weapon systems including intercontinental ballistic missiles, surveillance

platforms, tactical fighter aircraft, advanced avionics systems, stealth cruise missiles, training systems, and manned and unmanned special operations aircraft. He commanded an acquisition group, served as the program executive officer for fixed wing programs at USSOCOM, and was commander, Joint Acquisition Task Force Dragon, an elite team of USSOCOM and service acquisition personnel responsible for executing USSOCOM's most urgent acquisitions in response to wartime critical mission needs statements. He retired from the Air Force in the rank of colonel in July 2009 after more than 21 years of active duty. Prior to his current assignment, he was the deputy director, Special Operations Research, Development, and Acquisition Center, U.S. Special Operations Command, MacDill Air Force Base, Florida.



Harry Lee, Senior Computer Scientist, U.S. Census Bureau

Wednesday, March 22, 1:00–1:45

Harry Lee has served as the assistant director for information technology and deputy chief information officer for the U.S. Census Bureau since 2014. Prior to that, Mr. Lee served as the senior computer scientist for infrastructure for the U.S. Census Bureau.

In his role, Lee is responsible for the oversight of Census Bureau IT staff and IT divisions that provide enterprise infrastructure, IT applications, IT project management, IT acquisitions, and IT security for the Census Bureau. In addition, Mr. Lee's staff also performs systems engineering, IT service management and the Census Bureau's movement and maturation to an enterprise hybrid cloud environment.

Lee's continuous improvement of IT operations and service delivery include standardizing, stabilizing, and optimizing the IT infrastructure for the Census Bureau in alignment with all federal directives, strategies, and policies. This includes IT infrastructure for cloud computing, mobile computing, collaboration and unified communications, data management, security, and service management.

Lee has over 35 years combined military, private sector, and government technology and technology leadership experience. He joined the federal government in January 2004 after a successful 25-year IT career in the private sector, which included founding, growing, and successfully selling two information technology companies. Prior to joining the Census Bureau in May of 2012, he served as chief engineer and director of infrastructure architecture and engineering for the Internal Revenue Service, and prior to that served as director of enterprise solutions for Department of the Treasury.

Lee has a BS in operations analysis from the U.S. Naval Academy and an MS in technology of management from American University.

Tutorials

Monday, March 20 and Thursday, March 23

Many of our tutorials are offered on both Monday and Thursday to allow for flexibility in scheduling your week.

Agile in Government: Concepts for Senior Leaders

(offered on both Monday and Thursday)

Eileen Wrubel, Will Hayes, and Suzanne Miller, SEI

This tutorial provides an executive-focused introduction for those in a program or enterprise that is adopting or considering an Agile approach. Senior leaders and those who interact with them will benefit. The first part of the tutorial features a mini-tutorial addressing the topics senior leaders typically ask about, including

- Agile basics: life cycles, Agile manifesto, principles, methods, and practices
 - potential government acquisition roles in Agile settings
 - scaling issues for Agile, from team to large program
 - Agile insight and oversight: technical reviews, requirements management, and progress measurement
- Agile in the larger eco-system: systems engineering, contracting, testing, certification, and OSD policy
 - enabling an Agile culture: models that support adoption and readiness, and fit analysis

The second part of the tutorial will go back through the briefing from the viewpoint of someone who is championing Agile and who needs to understand how to present their viewpoint on Agile adoption to senior leaders. In addition to providing analysis information about the content, these additional topics will be addressed:

- communication approaches for getting senior leader buy-in
- characterizing the risks present in your adoption context
- adoption lessons learned from the SEI's work in helping government organizations adopt Agile approaches

QUELCE: Planning for Change, A New Era in Cost Estimation

(offered on both Monday and Thursday)

Robert Stoddard and Dave Zubrow, SEI

Extensive cost overruns in major defense programs are common and studies have implicated poor cost estimation as one of the major contributors. DoD Major Defense Acquisition Programs (MDAPs) expect two to three submissions to achieve independent cost estimate approval, resulting in delays of three to six months or more. The GAO has reported that the cost overrun growth in the DoD R&D portfolio in past five years amounts to \$32B. Research and experience have identified several factors associated with poor cost estimates. These include

- optimistic expectations about achievable program scope and technology that can be delivered on schedule and within budget
 - an enormous amount of unknowns and uncertainties that exist at the time when these estimates are made about large-scale, unprecedented systems that take years to develop and deploy
 - a heavy reliance (out of necessity) on expert judgment
- In this tutorial we teach the steps of a novel cost estimation method, Quantifying Uncertainty in Early Lifecycle Cost Estimation (QUELCE). QUELCE synthesizes future scenario thinking techniques—such as dependency structure matrices, Bayesian belief network models, and Monte Carlo simulation—into an estimation method that quantifies domain-specific uncertainties, allows subjective inputs by calibrated experts, visually depicts influential and cascading relationships among sources of uncertainty, plugs into the front end of existing cost models, and naturally produces a rich basis of estimate. QUELCE digests greater program execution information than traditional estimation tools but leverages techniques to limit the combinatorial explosion of complex, interacting, and cascading program change drivers for a more tractable cost estimate.

Secure DevOps Process and Implementation

(offered on both Monday and Thursday)

Hasan Yasar, SEI

This tutorial is designed for managers, developers, and operational teams to offer comprehensive security practices related to DevOps principles and processes and to identify techniques for security requirements gathering, secure development, and deployment from the beginning to the end

of the software lifecycle. Specifically, this tutorial will expose attendees to reference architectures and use cases on the Secure Continuous Integration (SCI) model, tools and practices, and the secured DevOps platform. We will provide technical demonstrations and practical scenarios.

Security Risk Management Using the Security Engineering Risk Analysis (SERA) Method

(offered on both Monday and Thursday)

Carol Woody, SEI

The SERA method is a model-based approach for analyzing complex security risks in software-reliant systems and systems of systems across the lifecycle and supply chain. Security risk analysis can be employed to reduce design weaknesses in software-reliant systems. During the acquisition and development of software-reliant systems, the focus is primarily on meeting functional requirements within cost and

schedule constraints, often deferring security to later life-cycle activities. Addressing design weaknesses as soon as possible is especially important because these weaknesses are difficult to correct after a system has been deployed. The SERA method provides systems engineers with a structure to connect desired system functionality with the underlying software to evaluate the sufficiency of requirements for software security.

Strategic Management of Technical Debt

(offered on both Monday and Thursday)

Ipek Ozkaya and Robert Nord, SEI

Technical debt concisely describes a universal software development phenomenon: expedient design or implementation choices that linger in the system will cause ripple effects that make future changes more costly. Taking on technical debt in the form of design shortcuts can be a strategic approach to help businesses and organizations take advantage of time-sensitive opportunities, fulfill market needs, and optimize resource management without impacting overall quality. Yet the results of recent empirical studies of industry practitioners' understanding about how technical debt accumulates and is

managed reveal that most technical debt is unintentional. If not properly managed, the interest on this debt may continue to accrue, severely hampering system stability and quality and impacting the team's ability to deliver enhancements at a pace that satisfies business needs. During this session, we will discuss the technical debt metaphor and learn about techniques for raising awareness and communicating technical debt. We will draw from concrete industry examples and experience to offer software development practices to improve the management of technical debt.

Common System and Software Testing Pitfalls

(offered only on Monday)

Don Firesmith, SEI

In spite of many great testing “how-to” books, people involved with system and software testing (such as testers, requirements engineers, system/software architects and engineers, managers, and customers) continually make many different types of testing-related mistakes. These commonly-occurring human errors can be thought of as system and software testing pitfalls. When projects unwittingly fall into them, pitfalls make testing less effective at uncovering defects, and people less productive at performing testing, and they harm project morale.

This presentation, which builds on my book by the same name, delves into a repository of 174 of these testing anti-patterns. In this repository, I organized the patterns into a taxonomy, documented each pitfall in terms of its name, description, potential applicability, characteristic symptoms, potential negative consequences, and potential causes, and included recommendations for avoiding them and mitigating the harm they cause.

Eliciting Innovative Requirements for DoD Systems: The KJ+ Method

(offered only on Monday)

Robert Stoddard, Michael Konrad, Mary Beth Chrissis, and Nancy Mead, SEI

Stakeholders often have requirements that they aren't aware of. Uncovering them can be quite challenging and involves a way of thinking not found in more traditional elicitation approaches. It requires probing interviews and the expanded use of context information to break through the confines of what the requirements engineer typically achieves with a specification-driven process. It requires a method that transforms stakeholders' tacit knowledge into explicit statements so that insightful and innovative requirements can emerge. The Elicitation of Unstated Requirements at Scale (EURS) research team at the SEI is currently working to develop and validate a method for determining the unstated needs of the varied stakeholders typical of today's large, diverse

programs (e.g., sociotechnical ecosystems). This method, tentatively called “KJ+,” will be scalable to address the needs of multiple categories of stakeholders; be usable by a diverse, non-collocated team of requirements analysts; and result in a more complete set of requirements that can be used as the basis for subsequent system design, implementation, and continued sustainment. The traditional KJ method for eliciting unstated user needs will be presented along with extensions that allow KJ to be used in a virtual environment. Finally, there will be a discussion of issues that must be addressed, such as tool support, to facilitate the use of KJ+ on a large scale by hundreds of stakeholders or more.

What Systems Engineers Need To Know About Software

(offered only on Monday)

Sarah Sheard, SEI

The F16, which first flew in 1976, relied on software for 40% of its capability. For F-22s in 1997, it was 80%. By 2006, the F-35 relied on software for 90% or more. In nearly all domains—education, medicine, transportation, education—software-based systems are providing unprecedented system function. Systems engineers are heeding these changes: as little as five years ago systems engineering conference papers had little to do with the increasing amount of software in systems, while today's conference themes are all about capabilities enabled by software.

Yet systems engineers have few resources to learn about software from a systems engineering and program management point of view. Books explaining software tend to focus on bits and bytes and skip over the big picture completely. This tutorial provides the basics of what systems engineers should know about software to partner effectively with software engineers and organizations to realize a dream they share: higher quality, higher capability systems that work properly and are capable of evolving as user needs evolve.

Architecture-centric Virtual Integration Practice: Concepts and Application

(offered only on Thursday)

John Hudak, SEI

Recent advances in virtual system integration using architecture modeling and analysis have led to improvements in many aspects of system quality. In this tutorial we discuss the challenges safety-critical software systems face and demonstrate ways that architecture-centric virtual integration practice (ACVIP) can be used to discover system-level issues early in development, making them much less expensive to mitigate. We structure our tutorial around an incremental life-cycle assurance approach and include real-world examples supported by a workbench of tools.

ACVIP uses the SAE International AS5506A Architecture Analysis and Design Language (AADL) standard to virtually integrate and analyze systems to detect and remove defects earlier in development—an approach used by an international commercial aerospace industry consortium. Using the entire aircraft as an example, we show how ACSVIP can be used to model aircraft subsystems, providing a system-wide evaluation of the impact of factors including weight, power, and hydraulic capacities. Modeling helps to ensure performance within and across all systems and that requirements are met.

Best Practices in Software Process and Product Measurement

(offered only on Thursday)

Bill Curtis, Senior Vice President and Chief Scientist, CAST Software

This tutorial covers advances in software measurement over the last decade, with a focus on three areas: productivity measurement, the measurement of improvement programs, and the measurement of software products. It includes case studies of successful measurement as well as the instructor's own experiences in setting up corporate software measurement programs, process improvement programs, and product measurement systems.

Attendees will learn

- best measures for different development methods
- best practices for valid productivity measures and their uses
- key indicators of improvement progress
- how measurement changes by organizational maturity level
- best practices for measuring lean, high maturity, and improvement progress
- how software product quality measurement has advanced

Secure Coding

(offered only on Thursday)

David Svoboda, SEI

This tutorial describes common programming errors and explains how these errors are exploited by attackers to perform remote-execution denial-of-service attacks and steal sensitive information. Web-based, automotive, and mobile device vulnerabilities will all be described. Understanding how common programming errors are exploited helps attendees to

think like an attacker, anticipate attacks that may result from architecture or design flaws, and evaluate the effectiveness of mitigation strategies. Strategies to mitigate these attacks—including software engineering, secure development, and secure coding practices—are described.

Monday, March 20

This at-a-glance agenda provides an overview of all of the tutorials and breakout sessions that are taking place at SSS 2017.

Program subject to change

7:00–8:00 Morning Beverages and Registration			
8:00 QUELCE: Planning for Change, A New Era in Cost Estimation Robert Stoddard and Dave Zubrow	8:00 Security Risk Management Using the Security Engineering Risk Analysis (SERA) Method Carol Woody	8:00 Agile in Government: Concepts for Senior Leaders Eileen Wrubel, Will Hayes, and Suzanne Miller	8:00 What Systems Engineers Need To Know About Software Sarah Sheard
10:00–10:30 Morning Break			
10:30 QUELCE: Planning for Change, A New Era in Cost Estimation <i>Continued</i>	10:30 Security Risk Management Using the Security Engineering Risk Analysis (SERA) Method <i>Continued</i>	10:30 Agile in Government: Concepts for Senior Leaders <i>Continued</i>	10:30 What Systems Engineers Need To Know About Software <i>Continued</i>
12:00–1:00 Lunch			
1:00 Strategic Management of Technical Debt Robert Nord and Ipek Ozkaya	1:00 Secure DevOps Process and Implementation Hasan Yasar	1:00 Eliciting Innovative Requirements for DoD Systems: The KJ+ Method Robert Stoddard, Mike Konrad, Mary Beth Chrissis, and Nancy Mead	1:00 Common System and Software Testing Pitfalls Don Firesmith
2:30–3:00 Afternoon Break			
3:00 Strategic Management of Technical Debt <i>Continued</i>	3:00 Secure DevOps Process and Implementation <i>Continued</i>	3:00 Eliciting Innovative Requirements for DoD Systems: The KJ+ Method <i>Continued</i>	3:00 Common System and Software Testing Pitfalls <i>Continued</i>
5:00 Adjourn for the Evening			

Tuesday, March 21

7:00–8:00 Morning Beverages and Registration		
8:00–8:30 Conference Welcome and Opening Remarks		
8:30–9:15 Keynote—Perspectives on Cybersecurity Testing: Lessons Learned Over Six Years of Operational Test and Evaluation , J. Michael Gilmore		
Applying Agile Methods	Software Vulnerabilities	Modernization & Sustainment
9:15–9:45 A Reverse Chronology of Evolutionary Architecture and Agile Development Mostafa Hanif, Thomas Mielke, and Brian Gallagher; CACI International, Inc.	9:15–9:45 The Relationship Between Design Flaws and Software Vulnerabilities: A Technical Debt Perspective Robert Nord and Ipek Ozkaya	9:15–9:45 Struggles at the Frontiers: Persistent Pursuit of Software Assurance in Development and Sustainment of Defense Systems Kenneth Nidiffer
9:45–10:15 Morning Break		
10:15–11:15 A Tale of Two (Agile) Programs Suzanne Miller and Will Hayes	10:15–11:15 Predicting Software Bug Closure Rates and Reliability Growth with Weibull Modeling Robert Stoddard, Julie Cohen, Rhonda Brown, SEI; and Chad Unruh, U.S. Air Force	10:15–11:45 Panel—Roadmap for Rapid IT Modernization and Cyber Resistance John Weiler, IT-AAC, Moderator; Vice ADM Kevin Green, former EVP IBM and Former D-CNO; Dr. Marv Langston, former Navy and DOD CIO; Mark Bogart, former DIA CAE; and MGEN Dale Meyerrose, former DNI CIO
11:15–11:45 6 Things You Need to Know About Data Governance John Klein	11:15–11:45 Using Malware Analysis to Identify Overlooked Security Requirements (MORE) Nancy Mead and Jose Morales	
11:45–12:15 The FBI Case Management System: The Story of Waterfall Failure and Agile Success Tom Friend, Duke Energy	11:45–12:15 Applied Machine Learning in Software Engineering: Case Studies Eliezer Kanal	11:45–12:15 Case Study of a Successful Government Roadmap Modernization Project Stephany Bellomo and Felix Bachmann
12:15–1:15 Lunch		
1:15–1:45 Demo Area Open		
1:45–2:30 Keynote: A Perspective on Military Software Needs , The Honorable Heidi Shyu		
2:30–2:45 Presentation of IEEE CS/SEI Watts S. Humphrey SPA Awards , Mike Konrad and Forrest Shull		
2:45–3:15 Afternoon Break and Demo Area Open		
Applying Agile Methods	Process Improvement	Modernization & Sustainment
3:15–4:15 Agile Technical Reviews: An Oxymoron? Carmen Graver, Graver Agile Innovations; Owen Seely, Naval Surface Warfare Center Dahlgren; and Michael Goings, Basic Commerce & Industries, Inc.	3:15–3:45 Watts Humphrey Award Winner: Improved Performance and Decision-Making through Design for Six Sigma Modeling & Analysis Neal Mackertich, Peter Kraus, and Kurt Mittelstaedt, Raytheon	3:15–4:45 Panel—Software Sustainment: Continuous Engineering to Deliver Warfighter Capability Michael McLendon, Moderator; Forrest Shull and Stephany Bellomo, SEI; and John Stankowski, Office of the DASD for Maintenance Policy and Programs
	3:45–4:15 Watts Humphrey Award Winner—Nationwide IT: A Software Process Improvement Journey Guru Vasudeva, Nationwide	
4:15–4:45 A Research Agenda for Agile Software Development Suzanne Miller and Will Hayes	4:15–5:15 Census Bureau Analysis of Alternatives Anthinino Galloway, U.S. Census Bureau; and Nanette Brown, SEI	
4:45–5:15 A Methodology for Comparing Cloud Service Offerings Jeff Davenport and Sarah Sheard		4:45–5:15 Methodology for the Cost Benefit Analysis of a Large Scale Multi-phasic Software Enterprise Migration Jerry Jackson
5:15–6:30 Welcome Reception (Demo Area Open)		

Wednesday, March 22

7:00–8:00 Morning Beverages and Registration		
8:00–8:15 Morning Remarks		
8:15–9:00 Keynote , James Geurts, U.S. Special Operations Command (SOCOM)		
Cost Reduction Strategies	Security & Safety	Integration & Test
9:00–9:30 Real-time Extraction of Biometrics Traits from Video Satya Veneti and Chase Midler	9:00–9:30 Security Measurement: Establishing a Confidence That Security Is Sufficient Carol Woody and Chris Alberts	9:00–9:30 Temporal Partitioning and Verification in Distributed Cyber-Physical Systems Dionisio de Niz and Bjorn Andersson
9:45–10:15 Morning Break		
10:00–11:00 So Much Money for So Little Capability—The Reality of Sustaining DoD Software Systems Fred Schenker, and Grady Campbell, SEI; and David Schneider, U.S. Army	10:00–11:00 Improvements in Safety Analysis for Safety-critical Software Systems Peter Feiler	10:00–11:30 Making Government as the Integrator (GATI) and Owning the Technical Baseline (OTB) Work Bill Novak, Moderator; Mr. James Horejsi, U.S. Air Force; Charles Gustafson, Aerospace; Ron Carlson, Naval Postgraduate School; and Brian Gallagher; CACI International, Inc.
11:00–12:00 Why Does Software Cost So Much? Toward a Causal Model Robert Stoddard and Mike Konrad, SEI; and David Danks, CMU	11:00–12:00 Risks in the Software Supply Chain Mark Sherman	11:30–12:00 CISQ Standards for Automated Measurement Software Size and Structural Quality Bill Curtis, CAST Software
12:00–1:00 Lunch		
1:00–1:45 Keynote: Learning to Drive a C.A.R. at Census , Harry Lee		
1:45–2:30 SEI Research , Jeff Boleng, SEI		
2:30–3:00 Afternoon Break and Demo Area Open		
3:00–3:30 Replacing Promises with Data: A Structured Way to Assess Software Health Fred Schenker, SEI; and Karen Lafond, U.S. Army	3:00–4:30 Panel—Secure Software Workforce Development Girish Seshagiri, ISHPI; Nancy Mead and James Over, SEI; and William Newhouse, National Institute of Standards and Technology (NIST)	3:00–3:30 How to Minimize Configuration Switching Time and Cost for Design of Experiments Robert Binder
3:30–4:30 Inclusion of Software in the Systems Tradespace Sarah Sheard, Mike Gagliardi, Mike Konrad, and Forrest Shull		3:30–4:30 Secure Tactical Cloudlets for Mission Support at the Edge Grace Lewis, Sebastian Echeverria, Dan Klinedinst, and Keegan Williams
4:30–5:30 Keynote Panel and Feedback Session		
5:30 Symposium Adjourns		

Thursday, March 23

7:00–8:00 Morning Beverages and Registration			
8:00 Architecture-centric Virtual Integration Practice: Concepts and Application John Hudak	8:00 Secure Coding David Svoboda	8:00 Best Practices in Software Process and Product Measurement Bill Curtis, CAST Software	8:00 Agile in Government: Concepts for Senior Leaders Eileen Wrubel, Will Hayes, and Suzanne Miller
10:00–10:30 Morning Break			
10:30 Architecture-centric Virtual Integration Practice: Concepts and Application <i>Continued</i>	10:30 Secure Coding <i>Continued</i>	10:30 Best Practices in Software Process and Product Measurement <i>Continued</i>	10:30 Agile in Government: Concepts for Senior Leaders <i>Continued</i>
12:00–1:00 Lunch			
1:00 Strategic Management of Technical Debt Robert Nord and Ipek Ozkaya	1:00 Secure DevOps Process and Implementation Hasan Yasar	1:00 QUELCE: Planning for Change, A New Era in Cost Estimation Robert Stoddard and Dave Zubrow	1:00 Security Risk Management Using the Security Engineering Risk Analysis (SERA) Method Carol Woody
2:30–3:00 Afternoon Break			
3:00 Strategic Management of Technical Debt <i>Continued</i>	3:00 Secure DevOps Process and Implementation <i>Continued</i>	3:00 QUELCE: Planning for Change, A New Era in Cost Estimation <i>Continued</i>	3:00 Security Risk Management Using the Security Engineering Risk Analysis (SERA) Method <i>Continued</i>
5:00 Adjourn			

SSS Sponsors



Venue: Hilton Crystal City



The Hilton Crystal City is adjacent to Ronald Reagan Washington National Airport and only 10 minutes from downtown Washington, DC. Surrounded by shops and restaurants and with a complimentary shuttle bus service to the Crystal City Metro station, this hotel is perfectly situated for your next visit to Arlington, VA. The hotel offers complimentary shuttle service to Reagan National Airport.

In addition to the Hilton Crystal City hotel's usual amenities, conference attendees who book within our room block will also receive

- complimentary internet
- discounted self-parking

All guests can enjoy access to the fully equipped 24 hour on-site fitness center



Parking

The hotel offers self-parking in a securely enclosed parking facility directly beneath the hotel, based on availability.

Parking rates for conference attendees who reserve within the SSS room block are as follows:

Daily: 3+ hours, \$15.00 Overnight: \$15.00

Driving directions from Ronald Reagan Washington National Airport

Follow signs to airport exit for Crystal City/Route 1.

Take Route 1 North (Jefferson Davis Highway).

After coming down the ramp, make the first right onto 23rd Street, then an immediate right onto Clark Street.

The Hilton Crystal City is directly on the right.

See the Hilton Crystal City hotel's Maps & Directions page for detailed instructions to the hotel from other locations and landmarks.

Hilton Crystal City at Washington Reagan National Airport
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1.703.418.6800

Metro

The nearest Metro stop is the Crystal City Metro Station, about a 10-minute walk from the hotel.



SATURN 2017

13th Software Engineering Institute Architecture Technology
User Network Conference



May 1–4, 2017 | Denver, Colorado

Online at sei.cmu.edu/saturn/2017 or e-mail info@sei.cmu.edu

FloCon 2018

14th Annual Open Forum for Large-Scale Network Analytics



January 8–11, 2018 | Tucson, Arizona

Online at cert.org/flocon or e-mail flocontact@cert.org



March 20-23, 2017 | Arlington, Virginia

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