SYSTEMS ENGINEERING RESEARCH CENTER

ATTENDEE GUIDE

PRE- EVENT:

PLATFORM OPENS
Nov. 17 - 8:30 AM EST
Nov. 18 - 8:00 AM EST

BROWSER

- **Google Chrome** is the recommended browser to access the event. It is also accessible via Firefox and Safari. Please refrain from using Internet Explorer
- To prep your browser settings: www.accelevents.com/u/system_checker

ENTER VIRTUAL PLATFORM

- If you haven't done so already, create a LOGIN (upper RIGHT CORNER): https://www.accelevents.com/e/2020SSRR
- Refresh the page > click **ENTER EVENT** button

ENGAGE WITHIN PLATFORM

- CREATE PROFILE
- ☆ SESSIONS OF INTERESTS
- REGISTER to add sessions to your customized agenda
- VIEW RECORDING, available 10 min after session has ended

DURING EVENT:

Nov. 17 (9:00 AM – 5:00 pm EST)
Nov. 18 (8:30 AM – 6:00 PM EST)

AGENDA

- View the complete schedule at a glance
- ANNOUNCEMENTS
- INFO DESK

MAIN STAGE

- DAY 1 | SDSF: All live presentations will happen within the Mainstage
- DAY 2 | Keynotes and Panel

RESEARCH TRACKS

- DAY 2 RESEARCH TRACKS:
  DIGITAL ENGINEERING | VELOCITY | SECURITY | AI&AUTONOMY | MISSION ENGINEERING

NETWORKING

- Connect with other attendees throughout the day in various network sessions

POSTER EXPO

- Explore research posters from SERC Doctoral Fellows & PhD Students
- Connect directly with poster authors though the expo

ATTENDEES + CONNECT

- Connect with attendees through the platform in various ways:
- setup 1:1 meetings
- chat in groups
- arrange to connect outside the platform

FURTHER ASSISTANCE:

- HELP DESK: 201-216- 8546
- EMAIL: serc@sercuarc.org
- FAQ'S:
  www.sercuarc.org/research-reviews/2020-serc-research-review/#faq

POST- EVENT:

PRESENTATION SLIDES

- Slides will be available on the SERC website **Friday, Nov. 20th**

VIRTUAL PLATFORM

- Registered attendees will have access to the platform until **Wednesday, Nov. 25 - 6:00 pm EST**

RECORDED PRESENTATIONS

- Recorded presentations will be available to download from the SERC website on **Friday Dec 4th.**

NOTES:

SYSTEMS ENGINEERING RESEARCH CENTER

8TH ANNUAL SERC DOCTORAL STUDENTS FORUM

NOVEMBER 17, 2020

ALL TIMES LISTED EASTERN STANDARD TIME

9:00 -- 9:55 AM	**CHECK-IN**	**POSTER EXPO**	**NETWORKING**
10:00 -- 10:10 AM	**WELCOME & OPENING REMARKS**: Mr. Tom McDermott, Deputy Director, Chief Technology Officer, SERC		
10:15 -- 10:40 AM	***Strategy Dynamics and System-of-Systems Tradespace Exploration*** ***Jordan* Stern**, Stevens Institute of Technology		
10:45 -- 11:10 AM	***Unmanned Aerial Systems (UAS) Sensor Data Networking*** **Russell Shirey**, Maj USAF, SERC Doctoral Fellow, Purdue University		
11:10 -- 11:25 PM	**15 MIN BREAK**	**POSTER EXPO**	**NETWORKING**
11:25 -- 11:50 AM	***Game Balance and Game Breaking: A Game Theory Approach*** **Prajwal Balasubramani**, Purdue University		
11:55 -- 12:20 PM	***Compositionality in Cyber-Physical Systems Theory*** **Georgios Bakirtzis**, University of Virginia		
12:20 -- 1:00 PM	**LUNCH**	**POSTER EXPO**	**NETWORKING**
1:00 -- 1:25 PM	***Applying Search Optimization Techniques in the Incorporation of New Technologies and Innovations in Modular System Upgrades*** **Romulo Broas**, Raytheon, SERC Doctoral Fellow, Stevens Institute of Technology		
1:30 -- 1:55 PM	***The Implementor's Dilemma for Digital Engineering*** **Stephanie Sharo Chiesi** , Formerly Raytheon, SERC Doctoral Fellow, Stevens Institute of Technology		
2:00 -- 2:25 PM	***MBSE Benefits: Evidence from the Literature and Insights from Practitioners*** **Kaitlin Henderson**, Virginia Tech		
2:25 -- 2:40 PM	**15 MIN BREAK**	**POSTER EXPO**	**NETWORKING**
2:40 -- 3:05 PM	***Rapid Aerostructural Design of UAV Wings for Direct Toolpath Generation*** **Justin Valenti**, Penn State		
3:10 -- 3:35 PM	***Identifying Security Patterns for Modular Open Systems*** **Giselle Bonilla-Ortiz**, Raytheon, SERC Doctoral Fellow, Stevens Institute of Technology		
3:35 -- 3:45 PM	**CLOSING REMARKS:** Mr. Tom McDermott, Deputy Director, Chief Technology Officer, SERC		
3:45 -- 4:45 PM	**VIRTUAL RECEPTION**	**PI / SPEAKER CHECK IN**	**POSTER EXPO**
	Join us in a casual meet and greet, to reconnect with colleagues and make some new connections.	*All PI's & Speakers will be invited to this meeting space, to check-in and review any questions about their sessions. (OPTIONAL)*	*All SDSF presenters research work is showcased within the Poster Expo.*

SYSTEMS ENGINEERING RESEARCH CENTER

12TH ANNUAL SERC SPONSOR RESEARCH REVIEW

NOVEMBER 18, 2020

ALL TIMES LISTED EASTERN STANDARD TIME

8:30 -- 9:00 AM	**CHECK-IN**	**NETWORKING**		**POSTER EXPO**
9:00 -- 9:15 AM	**WELCOME & OPENING REMARKS / AWARDS**: Dr. Dinesh Verma - Executive Director, SERC			
9:15 -- 10:00 AM	**MORNING KEYNOTE**: Dr. Sandra Magnus; Deputy Director for Engineering, Office of the Under Secretary of Defense for Research and Engineering			
10:05 -- 11:20 AM	**PANEL:** *Mission Engineering Research Challenges* PANELISTS: Elmer L. Roman, OUSD, (R&E) AC / Engineering; Donna Rhodes, MIT; Alejandro Salado, Virginia Tech; Dorothy McKinney, SE Consultant; Ryan Noguchi, Aerospace Corporation | MODERATORS: Judith Dahmann, MITRE and Dan DeLaurentis, Purdue; Chief Scientist, SERC			
11:20 -- 11:30 AM	**PANEL CONTINUED**	**NETWORKING**		**POSTER EXPO**
	DIGITAL ENGINEERING	**SECURITY**	**AI & AUTONOMY**	**MISSION ENGINEERING**
11:30 -- 12:10 PM	**WRT-1008 & ART 002** ***Transforming Systems Engineering through Model-Centric Engineering / MBSE*** Dr. Mark Blackburn, Stevens	**WRT-1013** ***Security Engineering 2019: Mission Aware Cyber Resilience*** Dr. Peter Beling, UVA	**WRT-1010** ***Meshing Capability and Threat-based Science and Technology (S&T) Resource Allocation*** Dr. Carlo Lipizzi, Stevens	**WRT-1002** ***Approaches to Achieve Benefits of Modularity in Defense Acquisition - Part 2*** Dr. Cesare Guariniello, Purdue
12:15 -- 12:55 PM	**ART-015** ***New Observing Strategies Testbed (NOS-T) Design and Development*** Dr. Paul Grogan, Stevens	**ART-004 & WRT-1033** ***Methods to Evaluate Cost/Technical Risk and Opportunity Decisions for Security Assurance in Design*** Mr. Tom McDermott, Stevens	**WRT-1017** ***Keyphrase Extraction Using Language Embeddings – Phase I & Phase II*** Dr. K. P. Subbalakshmi, Stevens	**ART-005** ***Methods for Integrating Dynamic Requirements & Emerging Technologies*** Dr. William Rouse, Georgetown
1:00 -- 1:40 PM	**WRT-1009** ***Model Curation Innovation and Implementation*** Dr. Donna Rhodes, MIT	**WRT-1022** ***Developmental Test and Evaluation (DT&E) and Cyberattack Resilient Systems*** Dr. Barry Horowitz, UVA ; Dr. Cody Fleming, Iowa State	**WRT-1019** ***Adaptive Cyber-Physical-Human Systems Testbed*** Dr. Azad Madni, USC	**ART-010** ***Managing System-of-Systems Complexity for Distributed Command and Control (C2)*** Dr. Dan DeLaurentis, Purdue
1:40 -- 2:05 PM	**BEST STUDENT PRESENTATION**	**NETWORKING**		**POSTER EXPO**
2:05 -- 2:35 PM	**AFTERNOON KEYNOTE – *The Acquisition Innovation and Research Center*** Ms. Stacy A. Cummings - Principal Deputy Assistant Secretary of Defense for Acquisition			
2:40 -- 3:20 PM	**WRT-1001** ***Digital Engineering Measures*** Mr. Tom McDermott, Stevens	**ART-014** ***Quantum Photonics Tasks for Research*** Dr. Yuping Huang, Stevens	**WRT-1023** ***Analyzing and Assessing Contracts for Embedded Risk*** Dr. Carlo Lipizzi, Stevens	**HUMAN CAPITAL DEVELOPMENT** **WRT - 1004** ***Helix - Organizational Systems Engineering Effectiveness 2019*** Dr. Nicole Hutchison, Stevens
3:25 -- 4:05 PM	***ART-016*** ***Integrated Mission Equipment (IME) Architecture Process for Vertical Lift Systems*** Dr. Paul Collopy / Dr. Bryan Mesmer, UAH	**ART-001** ***Characterization of Emerging Technologies in Military Environment*** Dr. Pradeep Lall, Auburn	**ART-007** ***Cognitive Bias in Intelligent Systems*** Dr. Laura Freeman, Virginia Tech	**WRT-1006** ***Preparing the Acquisition Workforce for Digital Engineering - Developing a Digital Engineering Competency Framework*** Dr. Nicole Hutchison, Stevens
4:10 -- 4:50 PM	**VELOCITY** **WRT-1012** ***Global Positioning Systems – Mission Engineering and Integration of Emerging Technologies*** Dr. Michael Orosz, USC	**ART -006** ***Risk-Based Approach to Cyber Vulnerability Assessment using Static Analysis*** Dr. Peter Beling, Mr. Tim Sherburne, Dr. Stephen Adams, Mr. Davis Loose, UVA	**ART-009** ***Intelligent Defense Systems*** Dr. Yu-Dong Yao, Stevens	**WRT-1007** ***Capstone Marketplace*** CAPT Bill Shepherd, Stevens
4:55 -- 5:35 PM	**WRT-1016** ***Reducing Total Ownership Cost (TOC) and Schedule*** Dr. Barry Boehm, USC	**COVID-19 SURVEY** ***On comparing the effects of "Work at Home" during COVID-19 between Systems Engineers and General Population*** Dr. Jose Ramirez-Marquez, Stevens	**WRT-1025** ***Using AI/ML Design Patterns for Digital Twins and Model-Centric Engineering*** Dr. Mark Austin, University of Maryland	**WRT-1018** ***DAU Credential Development*** Mr. Ralph Giffin, Dr. Carlo Lipizzi, Stevens
5:40 -- 6:00 PM	**CLOSING REMARKS** Dr. Dinesh Verma - Executive Director, SERC; Mr. Tom McDermott, Deputy Director, Chief Technology Officer, SERC			

TRUSTED SYSTEMS | ENTERPRISE SYSTEMS & SYSTEM OF SYSTEMS | SYSTEMS ENGINEERING & MANAGEMENT TRANSFORMATION | HUMAN CAPITAL DEVELOPMENT

11/16/20

KEYNOTE SPEAKERS

MORNING KEYNOTE | Wednesday, November 18 -- 9:15 – 10:00 AM

***Dr. Sandra Magnus**; Deputy Director for Engineering, Office of the Under Secretary of Defense for Research and Engineering*

Dr. Sandra H. "Sandy" Magnus is the Deputy Director for Engineering within the Office of the Under Secretary of Defense for Research and Engineering. She serves as the DoD's Chief Engineer for Advanced Capabilities. In this role, she is the lead for engineering policy, practice, and the DoD engineering workforce, as well as digital engineering and systems of systems engineering initiatives. She leads mission integration management, independent technical risk assessments, and program planning and execution. Dr. Magnus is a recipient of the NASA Space Flight Medal and the NASA Exceptional Service Medal, among other awards. Dr. Magnus received a bachelor of science in physics and a master of science in electrical engineering from the Missouri University of Science and Technology. She received a Ph.D. in engineering from the School of Materials Science and Engineering at Georgia Institute of Technology in 1996.

Formerly the Principal of AstroPlanetview, LLC, Dr. Magnus is also the former Executive Director of the American Institute of Aeronautics and Astronautics (AIAA), the world's largest technical society dedicated to the global aerospace profession.
Selected to the NASA Astronaut Corps in April 1996, Dr. Magnus flew on the STS-112 shuttle mission in 2002 and on the final shuttle flight, STS-135, in 2011. She flew to the International Space Station on STS-126 in November 2008 and served 4 months on board as flight engineer and science officer. Following her assignment on Station, she served at NASA Headquarters in the Exploration Systems Mission Directorate and as the deputy chief of the Astronaut Office.

While at NASA, Dr. Magnus worked with the international community, including the European Space Agency (ESA) and the Japan Aerospace Exploration Agency (JAXA), as well as with Brazil on facility-type payloads. She spent time in Russia developing and integrating operational products and procedures for the International Space Station.

Before joining NASA, Dr. Magnus worked for McDonnell Douglas Aircraft Company as a stealth engineer. She worked on internal research and development and on the Navy's A-12 Attack Aircraft program, studying the effectiveness of radar signature reduction techniques.
Dr. Magnus is a recipient of the NASA Space Flight Medal and the NASA Exceptional Service Medal, among other awards.
Dr. Magnus received a bachelor of science in physics and a master of science in electrical engineering from the Missouri University of Science and Technology. She received a Ph.D. in engineering from the School of Materials Science and Engineering at Georgia Institute of Technology in 1996.

AFTERNOON KEYNOTE | Wednesday, November 18 -- 2:05 – 2:35 PM

The Acquisition Innovation Research Center

***Ms. Stacy A. Cummings** - Principal Deputy Assistant Secretary of Defense for Acquisition*

Ms. Stacy Cummings is a career member of the Senior Executive Service, and currently serves as the Principal Deputy Assistant Secretary of Defense for Acquisition (PDASD(A)). In this position, she advises the Assistant Secretary of Defense for Acquisition (ASD(A)) on matters relating to the Department of Defense Acquisition System while advancing innovative, data-driven approaches across the acquisition enterprise.

Previously serving as the Program Executive Officer, Defense Healthcare Management Systems (PEO DHMS), Ms. Cummings managed the delivery of healthcare and advance data sharing through a modernized electronic health record for service members, veterans, and their families.

Ms. Cummings previously held senior executive positions at the Department of Transportation, where she established strategic direction, provided executive leadership, and managed daily operations as the Executive Director for the Federal Railroad Administration and the interim Executive Director for the Pipeline and Hazardous Material Safety Administration.
Beginning her career with the Department of the Navy, she held senior positions at the Naval Air Technical Data and Engineering Services Command; Commander, Fleet Readiness Centers; Program Executive Office for Command, Control, Communications, Computers and Intelligence; and the Space and Naval Warfare Systems Command.

Ms. Cummings holds a Master of Science in National Resource Strategy from the Industrial College of the Armed Forces and a Master of Science in Management/Information Systems from the Florida Institute of Technology. She received her Bachelor of Science in Business Logistics from the Pennsylvania State University.

Certified in both Program Management and Acquisition Logistics, Ms. Cummings is a graduate of the Naval Air Systems Command's Senior Executive Management Development Program and the Defense Senior Leader Development Program. Ms. Cummings received Meritorious and Superior Civilian Service Awards from the Department of the United States Navy, Meritorious Public Service Award from the United States Coast Guard, and the Office of the Secretary of Defense Medal for Exceptional Civilian Service.

PANEL | Wednesday, November 18 (10:05-11:30 AM)

Mission Engineering Research Challenges

Increasingly systems engineering is being applied to larger sociotechnical systems of systems and enterprises. Recently, the US Department of Defense has shifted engineering focus from systems alone to addressing the larger mission context for systems and to treating the mission as the 'system of interest'. This panel will address the research challenges posed by applying systems engineering to missions. What makes mission engineering different? What is new? What are the technical challenges? What are research areas which are called for to address these challenges?

MODERATORS: ***Dr. Judith Dahmann***, MITRE and ***Dr. Dan DeLaurentis***, Purdue; Chief Scientist, SERC

PANELISTS:

Mr. Elmer Roman - Director, Mission Integration, OUSD, (R&E) AC / Engineering

Dr. Donna Rhodes - Principal Research Scientist, MIT

Dr. Alejandro Salado - Director, Systems Engineering Program, Virginia Tech

Ms. Dorothy McKinney - SE Consultant; CEO, ConsideredThoughtfully

Mr. Ryan Noguchi - Director of the Space Architecture Department, The Aerospace Corporation