

# RESEARCH REVIEW 2020

*Topics, speakers, and schedule are subject to change.*

## MONDAY, NOVEMBER 9

11:00 a.m.–11:05 a.m.	Welcome to the 2020 CMU SEI Research Review from the SEI Director	Dr. Paul Nielsen
11:05 a.m.–11:10 a.m.	Welcome to the 2020 CMU SEI Research Review from the CMU Vice-President of Research	Dr. J. Michael McQuade
11:10 a.m.–11:25 a.m.	Realizing Algorithmic and Computational Advantage Including the Need for an AI Engineering Discipline	Dr. Matt Gaston
11:25 a.m.–11:35 a.m.	Break	
11:35 a.m.–12:20 p.m.	Advancing AI Engineering for Defense and National Security	Moderator: Dr. Matt Gaston Panel: Lieutenant General Michael S. Groen, Dr. Mary “Missy” Cummings, and Dr. John Beiler
12:20 p.m.–12:35 p.m.	Break	
12:35 p.m.–12:40 p.m.	Introduction to Presentations	Dr. Matt Gaston
12:40 p.m.–1:10 p.m.	Train but Verify: Towards Practical AI Robustness	Dr. Nathan VanHoudnos Q&A: Ms. Tanisha Smith and Mr. Jon Helland
1:10 p.m.–1:40 p.m.	Investigating Techniques for Summarizing and Searching Video	Mr. Edwin Morris and Mr. Adam Harley
1:40 p.m.–1:45 p.m.	Break	
1:45 p.m.–2:15 p.m.	Ethics in AI Engineering	Ms. Carol Smith Q&A moderator: Ms. Alex Van Deusen
2:15 p.m.–2:25 p.m.	Knowing When You Don’t Know: Engineering AI Systems in an Uncertain World	Dr. Eric Heim
2:25 p.m.–2:30 p.m.	Break	
2:30 p.m.–3:10 p.m.	Topics in Advanced Computing: The Promise and Challenges of Recommendation Systems for the DoD	Dr. John Wohlbiere Q&A: Dr. Wohlbiere and Dr. Scott McMillan
3:10 p.m.–3:15 p.m.	Break	
3:15 p.m.–3:25 p.m.	Bringing it all Together	Dr. Thomas Longstaff, Chief Technology Officer

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3:25 p.m.–3:30 p.m.	<b>BREAK TO TRANSITION TO POSTER ROOMS</b>	
3:30 p.m.–4:00 p.m.	<b>Concurrent Sessions: Four Poster Presentations and Discussions</b>	
	Poster: Characterizing and Detecting Mismatch in ML-Enabled Systems	Dr. Grace A. Lewis
	Poster: Improving Human Decision Making with AI Decision Support Systems	Mr. Rotem Guttman
	Poster: Quantum Advantage Evaluation Framework	Dr. Jason Larkin
	Poster: Spiral/AIML: Resource-Constrained Co-Optimization for High-Performance, Data-Intensive Computing	Dr. Scott McMillan

<b>TUESDAY, NOVEMBER 10</b>		
11:00 a.m.–11:05 a.m.	Welcome	Dr. Thomas Longstaff
11:05 a.m.–11:15 a.m.	Engagement in all Facets of Cyberspace and Cyber-enabled Systems Essential to Mount an Effective Response	Mr. Roman Danyliw
11:15 a.m.–12:15 p.m.	Advancing Cyber Operator Tradecraft through Automated Static Binary Analysis: Program Reachability for Vulnerability and Malware Analysis	Dr. Edward Schwartz and Mr. Cory Cohen Q&A moderator: Mr. Jeffrey Gennari
12:15 p.m.–12:30 p.m.	Break	
12:30 p.m.–12:35 p.m.	Framing: Combining Automated Code Repair for Memory Safety and Static Code Analysis Systems	Mr. Robert Schiela
12:35 p.m.–12:55 p.m.	Automated Code Repair for Memory Safety	Dr. Will Klieber
12:55 p.m.–1:15 p.m.	Static Code Analysis Classification	Dr. Lori Flynn
1:15 p.m.–1:20 p.m.	Combining Automated Code Repair for Memory Safety and Static Code Analysis Systems	Dr. Lori Flynn
1:20 p.m.–1:30 p.m.	Q&A: Combining Automated Code Repair for Memory Safety and Static Code Analysis Systems	Dr. Lori Flynn, Dr. Will Klieber, and Mr. Robert Schiela
1:30 p.m.–1:35 p.m.	Break	
1:35 p.m.–1:40 p.m.	Framing: Implementing Cyber Security	Mr. Roman Danyliw
1:40 p.m.–2:40 p.m.	Implementing Cyber Security in DoD Supply Chains	Moderator: Dr. William Claycomb Panel: Mr. Joe Bradley, Mr. Dan Costa (chat moderator), Mr. Matthew Butkovic, Dr. Mark Sherman, Dr. Carol Woody, and Dr. Kenneth Mai
2:40 p.m.–2:45 p.m.	Break	
2:45 p.m.–3:10 p.m.	Toward the Use of Human-Machine Teaming and Fully Autonomous Operations	Mr. Jeffrey Mattson
3:10 p.m.–3:25 p.m.	AIDE: Artificial Intelligence Defense Evaluation	Dr. Shing-hon Lau and Dr. Grant Deffenbaugh
3:25 p.m.–3:45 p.m.	About the President's Cup Competition	Mr. Matt Kaar
3:45 p.m.–3:55 p.m.	Bringing it all Together	Dr. Thomas Longstaff
3:55 p.m.–4:00 p.m.	Closing	

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## THURSDAY, NOVEMBER 12

11:00 a.m.–11:05 a.m.	Welcome	Dr. Thomas Longstaff
11:05 a.m.–11:25 a.m.	Enabling DoD to Produce Systems that are Agile and Responsive to its Missions	Dr. Jeff Boleng
11:25 a.m.–11:30 a.m.	Break	
11:30 a.m.–12:35 p.m.	Software Engineering's Grand Challenges: Voices from Visionaries	Moderator: Ms. Anita Carleton Panel: Mr. Tim Dare, Dr. J. Michael McQuade, Dr. Deborah Frincke, Dr. Vint Cerf, Mr. Nand Mulchandani, Mr. John Robert (chat moderator), Dr. William Scherlis, Mr. Jeff Dexter, and Ms. Sara Manning Dawson
12:35 p.m.–12:50 p.m.	Break	
12:50 p.m.–12:55 p.m.	Framing	Dr. Ipek Ozkaya
12:55 p.m.–1:15 p.m.	Untangling the Knot: Enabling Rapid Software Evolution	Mr. James Ivers
1:15 p.m.–1:35 p.m.	TwinOps—Digital Twins meet DevOps	Dr. Jerome Hugues
1:35 p.m.–1:55 p.m.	Q&A: TwinOps and Untangling the Knot	Dr. Ipek Ozkaya, Dr. Jerome Hugues, and Mr. James Ivers
1:55 p.m.–2:00 p.m.	Break	
2:00 p.m.–2:25 p.m.	Model Based Engineering with AADL: Transitioning Research to Practice	Dr. Sam Procter
2:25 p.m.–2:40 p.m.	Q&A: Model Based Engineering with AADL: Transitioning Research to Practice	Dr. Ipek Ozkaya, Dr. Sam Procter, and Dr. Jerome Hugues
2:40 p.m.–2:55 p.m.	Bringing it all Together	Dr. Thomas Longstaff
2:55 p.m.–3:00 p.m.	<b>BREAK TO TRANSITION TO POSTER ROOMS</b>	
3:00 p.m.–3:30 p.m.	<b>Concurrent Sessions: Four Poster Presentations and Discussions</b>	
	Poster: High-Assurance Software-Defined IoT Security	Mr. Sebastian Echeverria
	Poster: Investigating the Feasibility of an Integrated Causal Model for Software Cost Control	Dr. William Nichols and Dr. Michael Konrad
	Poster: Multicore Confidence	Dr. Bjorn Andersson
	Poster: Rapid Certification of Trust	Dr. Dionisio de Niz

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## FRIDAY, NOVEMBER 13

11:00 a.m.–11:05 a.m.	Welcome	Dr. Thomas Longstaff
11:05 a.m.–11:25 a.m.	Integrating CI/CD Processes Across the Acquisition Lifecycle	Ms. Eileen Wrubel
11:25 a.m.–11:30 a.m.	Break	
11:30 a.m.–12:15 p.m.	Software Research in Action: Multidisciplinary Work Supporting a Paradigm Shift in DoD Acquisition	Moderator: Dr. Forrest Shull Panel: Ms. Linda Parker Gates (chat moderator), Mr. Sean Brady, Dr. Amy Henninger, and Mr. Shane Ficorilli
12:15 p.m.–12:30 p.m.	Break	
12:30 p.m.–12:35 p.m.	Framing	Ms. Eileen Wrubel
12:35 p.m.–12:55 p.m.	Rapid Adjudication of Static Analysis Alerts During Continuous Integration	Dr. Lori Flynn
12:55 p.m.–1:15 p.m.	Automated Design Conformance During Continuous Integration	Dr. Rod Nord
1:15 p.m.–1:35 p.m.	Q&A: Discussion with Researchers in Rapid Adjudication of Static Analysis Alerts and Automated Design Conformance	Mr. Hasan Yasar, Dr. Lori Flynn, and Dr. Rod Nord
1:35 p.m.–1:40 p.m.	Break	
1:40 p.m.–2:20 p.m.	Modernization for Rapid Delivery of Enhanced Capability/Reduction of Sustainment Costs	Moderator: Ms. Suzanne M. Miller Panel: Ms. Brigid O’Hearn and Mr. Stephen Falcone
2:20 p.m.–2:25 p.m.	Break	
2:25 p.m.–3:05 p.m.	CMU SEI Agile Virtual Schoolhouse	Ms. Suzanne Miller and Mr. Will Hayes Q&A moderator: Ms. Crisanne Nolan
3:05 p.m.–3:10 p.m.	Break	
3:10 p.m.–3:20 p.m.	Bringing it all Together	Dr. Thomas Longstaff

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