SYSTEMS ENGINEERING DEPARTMENT
NAVAL POSTGRADUATE SCHOOL

SYSTEMS ENGINEERING NEWSLETTER — September 2024

In This Issue:

Letter from the Chairman

Systems Engineering Chairman
Dr. Oleg Yakimenko

Welcome to the Systems Engineering Newsletter for the Summer quarter of Academic Year 2024!

This quarter, the SE Department graduated 73(!) students - 30 with an ABET EAC accredited Master of Science in Systems Engineering degree, four with a Master of Science in Systems Engineering Analysis degree, and 29 with a Master of Science in Systems Engineering Management degree. Eight students (James Allen Geddes, Jamie Calanche, Neil Olson, Kieran Xavier Conley, LCDR Yohan Desjardins, Maj Hui Yang Chew, Maj Zhi Hao Ong, and He Jiang Tan) were nominated for graduation with distinction. Alvin Jin Hong Goh's, David Walsh's, and Neil Olson's theses were recognized as outstanding theses. Allison Anne Gregory, David Walsh, and Joshua Hersh received the Meyer Award for Academic Excellence. LT Jarrod Kujawski received the Naval Sea Systems Command Award for Excellence in Systems Engineering.

On September 27th, the Summer quarter's 202 graduates, their families, faculty, staff, and guests attended the Summer Quarter Graduation Ceremony in King Hall. The commencement address was given by the Acting Provost Dr. James Newman, a former NASA astronaut who flew on four Space Shuttle missions.

In the Summer quarter, SE faculty taught 22 resident and distance learning sections and kept advising seventeen capstone project teams. They also continued guiding research of SE's Ph.D. students, serving on a variety of departmental and schoolwide committees; participating in scientific conferences including the 34th INCOSE's International Symposium, and finalizing their FY24 reimbursable research projects. Seven SE faculty were selected to participate in the FY25 Naval Research Program based on CNO priorities identified by OPNAV N72.

I would like to thank all members of the SE department for their contributions and congratulate our winter graduates and their families once again. Please, spread the word about NPS and SE Department, and stay connected with your alma mater!

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580 Capstone Project has Students Build New Wave-Absorbing Beach for NPS Naval Engineering Lab

A team of five students, from the 580 curriculum, built and tested a new wave-absorbing beach for their capstone project. The team consisted of LT Jarrod Kujawski and LT Andrew Staley from the 224 cohort, along with LT Joseph Bahleda, LT Dominic Barbusa, and LT Avery Hill from the 232 cohort. The project was motivated by the need to replace the existing beach in the NPS towing tank with wave generation capability. That beach was designed without using a rigorous systems engineering process, resulting in it being constructed from metal, that was not corrosion resistant, and wood, that had started to rot. These deficiencies meant the beach was at the end of its service life. However, without a wave-absorbing beach, generated waves reflect off the back wall making it impossible to achieve the desired wave environment within the tank. The installation of a replacement beach was critical for NPS to maintain the capability of doing naval engineering experimental testing.

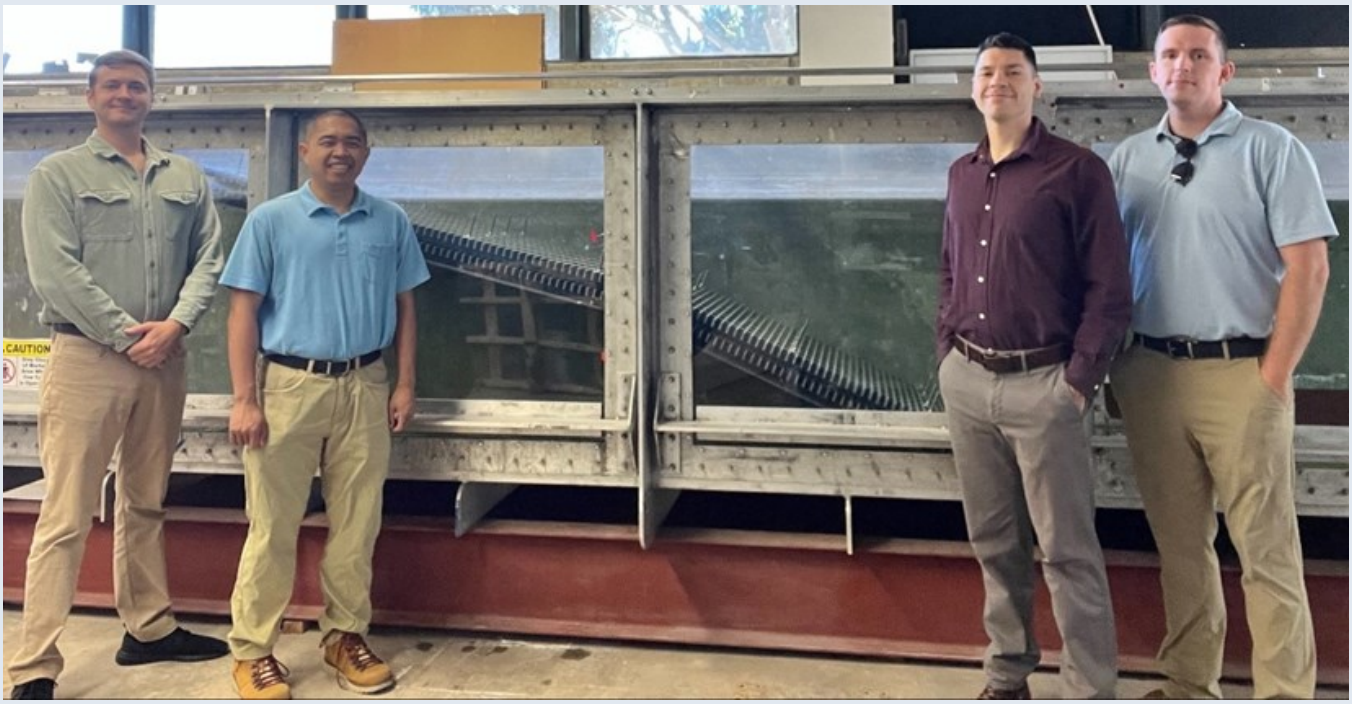
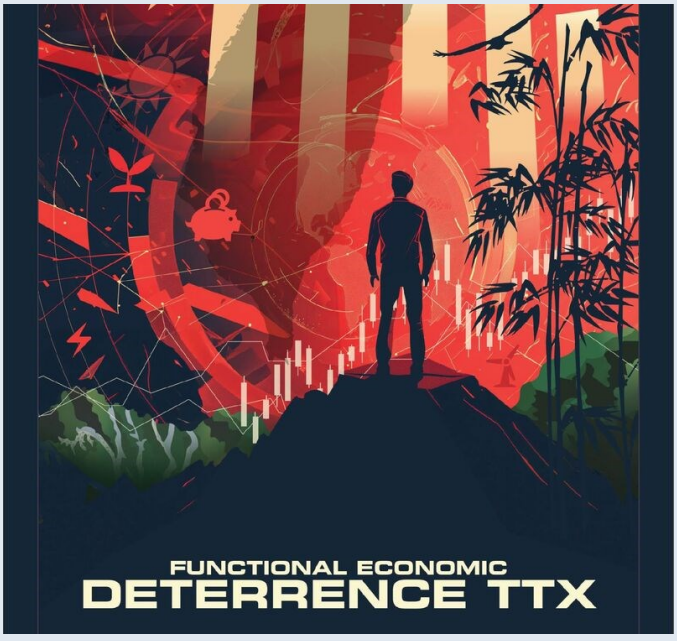


Photo showing four of the five team members and the wave-absorbing beach that they built and installed within the NPS towing tank with wave generation capability; from L to R: LT Staley, LT Barbusa, LT Bahleda, and LT Kujawski (not shown LT Hill)

The team utilized their systems engineering knowledge and skills gained throughout the degree program. They started with a generic design, provided by naval architect subject matter expert John Hoytt, and performed a detailed design study with a focus on supportability and maintainability. The design also had to eliminate future issues that would occur during installation and operation, such as interferences with the towing carriage pulley system, if not addressed at this point in the design. By consulting with NPS machinist John Mobley, the team improved the producibility of the design and created precise engineering drawings so pieces could be cut to the right sizes to account for variations in the tank dimensions. Due to the size and weight of the beach, it had to be assembled in-place within the tank. This provided the team invaluable experience about the importance of considering human-factors in the design, such as the ability to physically reach fasteners and tighten them within a confined space. Finally, the team evaluated the performance of the beach through validation testing. Using acoustic sensors, they collected wave elevation measurements along the length of the tank for many generated wave environments consisting of different wavelengths and wave heights. This data was processed by an analysis code, written by the team, to estimate the amount of energy being reflected instead of absorbed by the beach. The results showed that the team met the performance requirement over the parameter space typically used for testing. Through appropriate choices of materials during the early design process, it is expected that the beach will have an extremely long service life and require minimal, if any, maintenance. Not only was the capstone project a valuable educational experience for the team, but their effort ensures that NPS will maintain the ability to conduct experimental testing in a controlled wave environment of naval relevant topics, such as control of autonomous vehicles and energy harvesting, for the foreseeable future.

JS J7 Project Story

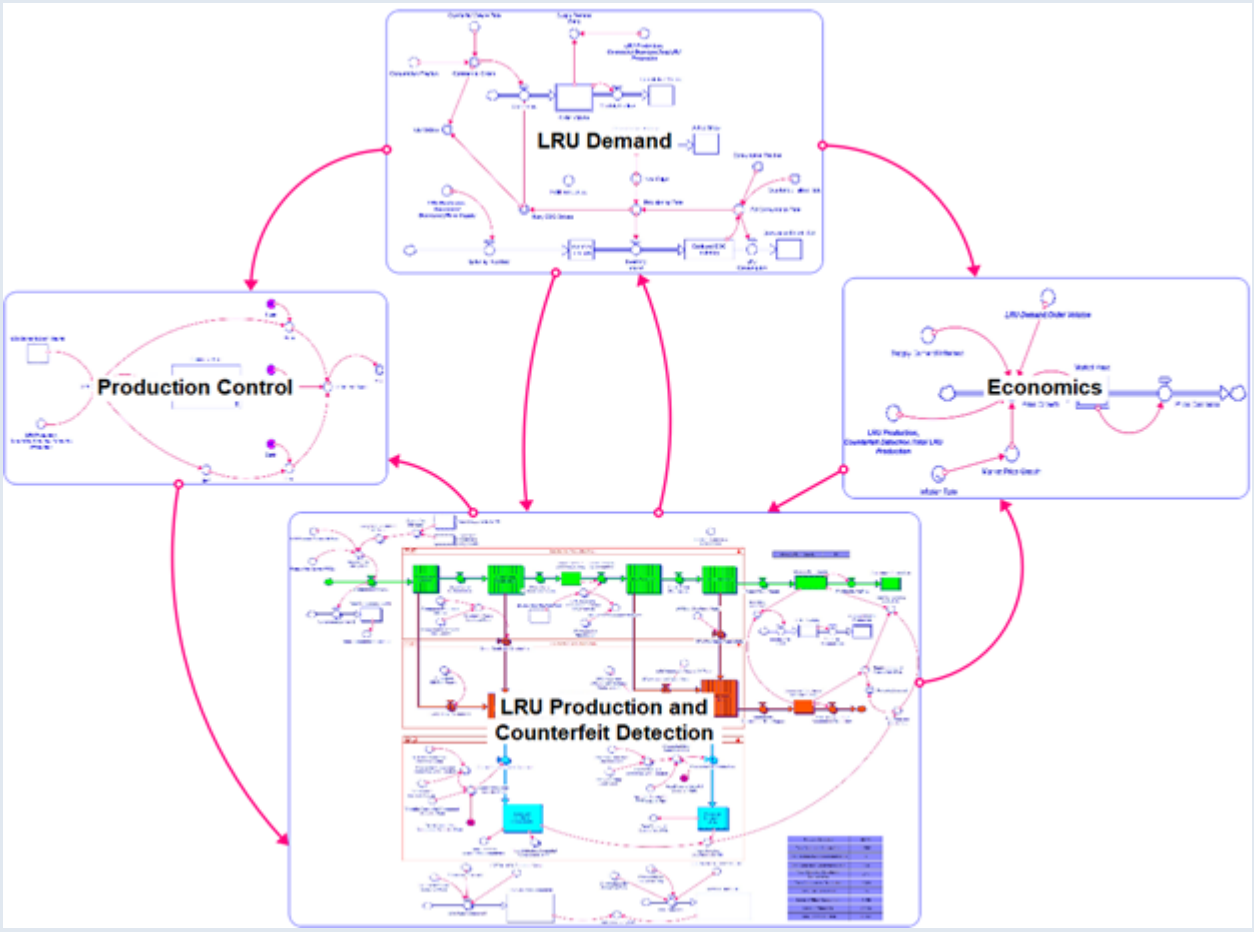
An interdisciplinary team of Naval Postgraduate School (NPS) faculty recently co-led and participated in a five-day, classified wargame titled “Functional Economic Deterrence TTX” for a diverse group of stakeholders and experts in Washington, D.C., part of NPS’ continuing efforts to examine integrated deterrence options that shape and inform advance future force design and joint warfighting concepts in support of the Directorate for Joint Force Development (J7). “This strategic analytic simulation of a China-Taiwan crisis scenario explored various economic and information deterrence options that could be employed to deter the PRC’s (People’s Republic of China) military aggression,” explained Dr. Andy Hernandez, a retired U.S. Army colonel and current Associate Chair for Operations in the NPS Department of Systems Engineering, and lead principal investigator on this project. “The objectives focused on two topics,” Hernandez continued, “to identify economic initiatives and activities that would have an impact on the PRC’s decision calculus, and, to gauge PRC responses that the U.S. and its allies must be prepared to mitigate.” Students from NPS and beyond were afforded the opportunity to participate in the event, including an NPS doctoral student, and undergraduate students in a National Security Agency internship program, among others. “Application of theory is a critical part of learning,” noted Hernandez. “The student’s ability to recognize that, while theory provides the foundation for our work, it is only the beginning. Innovative, critical thinking is essential for success.” • More about Systems Engineering at NPS: https://nps.edu/web/seet • Read more about NPS wargaming support to J7: https://lnkd.in/d-2X8DGp US Navy | United States Marine Corps | The Joint Staff | U.S. Naval War College | SAIC #usnavy #jointforce #deterrence #wargaming



Summer 2023 Interns

Drs. Ron Giachetti and Hyatt Moore advised a team of three interns in Summer 2023. The three interns were Gabino Valladares who graduated from Salinas High School and will start studying engineering at California Polytechnic at San Luis Obispo, Sabrina Giachetti who graduated Carmel High School and will study interdisciplinary science at Florida State University, and Kaiya Moore who is a senior at Salinas High School. The interns worked on a project to simulate mine warfare. Specifically, they were investigating the performance of traditional static mines versus a concept for mobile mines. The student interns had to quickly learn MatLab, which the simulation model was programmed in. They extended the simulation code and used the simulation model to conduct experiments comparing static mines to mobile mines.

Student and Faculty Team Publish Article on Supply Chain Counterfeit Part Detection using a Systems Dynamic Approach



Three systems engineering PhD students and two professors recently published an article titled: "The impact of counterfeit components and LRUs in the navy surface warfare supply chain: A systems dynamics approach." The article started as a class project in Dr. Wayne Porter's "System Dynamics Modeling for Planning and Design" course (DA4481) which systems engineering PhD students have been electing to take in recent years. Cody Reese, Seth Bourn, and Jason Bickford worked together on the class project which helped Dr. Porter and Dr. Douglas L. Van Bossuyt with their research agenda in counterfeit parts detection. The system dynamics approach lent itself well to developing a better technique of identifying the impact of counterfeit parts for the Navy and DoD. Over the course of a year, the students and professors worked together to further develop the project into a report that has been briefed to sponsors and an article now published in the Wiley Journal of Systems Engineering.

The article can be found at: https://doi.org/10.1002/sys.21785

The article's abstract is:

Microelectronics integrity is a critical issue for many industries including the Department of Defense (DoD). The military systems the DoD operates are particularly vulnerable to counterfeiting, with potentially costly or even catastrophic consequences. Counterfeits, regardless of production intent (malign or ersatz), raise significant concerns for industry and the DoD because they often demonstrate operational performance shortcomings, have lower reliability, or make components or organizations more vulnerable to attack. This article uses a systems dynamics modeling approach to explore the economics of counterfeiting for a sample system, the interactions between counterfeiters and the US Navy supply chain, and the impacts of counterfeit surveillance and detection to address the question: Is it more effective to target detection efforts at the component level or at the Line Replaceable Units level? A case study of an engine control module for the LM2500 propulsion turbine used on US Navy Arleigh Burke class guided missile destroyer (DDG-51) platforms is provided to demonstrate the approach.

Naval Sea Systems Command NAVSE Award

LT Jarrod Kujawski was presented the September 2024 Naval Sea Systems Command NAVSEA Award for Excellence in Systems Engineering during the 2024 summer quarter Award Ceremony, 17 September 2024. He was joined by his wife and son. LT Kujawski received this award in recognition of his superior academic accomplishments, excellence in thesis research, and overall leadership among his peers. His thesis, "COST-BENEFIT MODELING OF MICROGRIDS FOR BASE INSTALLATIONS" was a high caliber effort that will shape the foundation for a more resilient Navy. The recommendations he provides in the study is supported with evidentiary data and meticulous analysis that prescribe the way-ahead for the naval community to create a more capable Navy with increased operational reach. LT Kujawski graduated with a MS degree in Systems Engineering. He is a submariner who's next assignment is to Department Head School, Naval Submarine School, Naval Submarine Base New London, Connecticut. The SE Department looks forward to monitoring the successes of this officer's career.

PhD Students Meet at NPS

Several systems engineering PhD students met on the NPS campus in September while working on their doctoral research. Roger Cutitta was celebrating his recent advancement to PhD candidacy while Jason Thomas was celebrating his nomination for advancement to candidacy. All met with professors at NPS during their time in Monterey, worked with the Graduate Writing Center, and used the systems engineering student study space in Root Hall. The students caught up with Dr. Douglas L. Van Bossuyt, the SE Department's PhD Committee Chair and Academic Associate over lunch at the Café Del Monte while discussing the next steps in their higher education journeys and sharing lessons learned and best practices.

From left to right: Tracy Nguyen, Jason Thomas, Dr. Douglas L. Van Bossuyt, Roger Cutitta, and Noah Weitz

September Student Meyer Award

Mr. Joshua Hersh

Hersh resides in Huntsville, Alabama and works for the U.S. Army Combat Capabilities Development Command Aviation and Missile Center (DEVCOM AvMC) headquartered at Redstone Arsenal. His professional experience includes key roles in the U.S. Army's Improved Turbine Engine Program (ITEP), where he served as both a Reliability, Availability, and Maintainability (RAM) Engineer and a Project Engineer. Recently, he transitioned into a new role as a Systems Engineer, supporting a U.S. Army Uncrewed Aircraft System (UAS) program. Outside of work, Hersh is a passionate Cleveland Browns fan who enjoys spending time with his family, friends, girlfriend, and sheepadoodle.

During his time at NPS, Hersh successfully led several student teams in completing complex course assignments and projects. Despite the challenges, his favorite aspect of the program was the opportunity to collaborate with colleagues from various locations, including California, Maryland, Hawaii, and Canada. The NPS experience not only improved his leadership, communication, and collaboration skills but also provided him with practical knowledge in Systems Engineering. Hersh has since applied these skills directly to his current role, particularly in areas like Model-Based Systems Engineering (MBSE), systems integration, and requirements development.

David Walsh is a Program Lead aboard Naval Air Warfare Center Aircraft Division, Webster Outlying Field in Saint Inigoes, Maryland. A retired U.S. Marine Corps Captain, he draws upon more than 25 years of
experience—spanning from enlisted, officer, defense industry, and government roles—to rapidly deliver communications solutions to warfighters and government agencies. David holds a B.A. (Hons) from Worcester State College; a Certified Associate in Project Management credential from the Project Management Institute; a CompTIA Security+ certification; is published in the Marine Corps *Gazette*; and is a Systems Engineering Management student at the Naval Postgraduate School. In his spare time, David cherishes spending time with family, enjoys traveling, and physical fitness.
I look forward to sharing the Systems Engineering, Program Management, and Defense Acquisition knowledge gained throughout the SEM-PD21 curriculum with my government and industry partners at the NAWCAD WOLF Special Communications Mission Solutions Division. Specifically, I'm eager to support an organizational transition from document-centric processes and procedures to digital engineering with modern technology and model-based systems engineering tools. In doing so, we'll be better positioned to rapidly develop, deliver, and support the warfighter's needs in our new 21st century hybrid work environment.

Mr. David Walsh

Ms. Allison Gregory

Allison Gregory is a seasoned contracting professional with over 15 years of experience at Army Contracting Command – Aberdeen Proving Ground. In her time with ACC-APG, she supported several PEO Command Control Communications - Tactical (C3T) missions and served as Contracting Officer/Team Lead for the Responsible Strategic Sourcing for Services (RS3) contract, a multiple award Indefinite Delivery – Indefinite Quantity (IDIQ) contract which provided DoD mission partners access to a pool of 261 vendors capable of supporting professional service requirements. More recently, Allison has been instrumental in executing the Army's Digital Transformation by facilitating the migration of Integrated Personnel and Pay System – Army (IPPS-A), the Army's largest software system, from a monolithic waterfall development with a single vendor to a modern modular agile approach with multiple vendor sourcing. During her studies, Allison led the Ghost Army capstone team in development of the Assisted Microgrid Planning System (AMPS), an initiative project that utilized agile methodologies and generative AI to develop a microgrid planning tool. AMPS is a prototype tool that performs compatibility checks on microgrid components and generates viable architectures using commercial off the shelf components based on specific user-input requirements. AMPS interfaces with the existing NPS Microgrid Planner, supporting facilities managers in initial microgrid design planning. Allison will soon be putting the knowledge and experience she gained at Naval Postgraduate School in a new position supporting PEO Enterprise as an acquisition manager, helping further advance the Army's goals to modernize software development.

Faculty Receives Letter of Commendation

CAPT, USN (ret) Don Muehlbach, PhD was selected by the graduating students of cohort 311-231O to receive The Wayne E. Meyer Award for Teaching Excellence for September 2024 graduation. This was his 30th Meyer award. He joined the NPS SE department faculty as a Professor of Practice in February 2009.

Systems Engineering Graduation Photos

Awards and Graduations

Outstanding Thesis (DL)

Captain, USMC (Ret.) David M. Walsh, Naval Air Warfare Center Aircraft Division, Webster Outlying Field, Special Communications Mission Solutions

Mr. Neil Olson, Naval Surface Warfare Center, Crane Division

Outstanding Thesis (Resident)

Mr. Alvin Jin Hong Goh, Singapore Technologies Engineering

Meyer Award for Teaching Excellence (DL)

CAPT Don Muehlbach, PhD

Dr. Rama D Gehris

Daniel A. Eisenberg

Meyer Award for Academic Excellence (DL)

Ms. Allison Anne Gregory, U.S. Army Contracting Command - Aberdeen Proving Ground

Captain, USMC (Ret.) David M. Walsh, Naval Air Warfare Center Aircraft Division, Webster Outlying Field, Special Communications Mission Solutions

Mr. Joshua A. Hersh, U.S. Army Combat Capabilities Development Command, Aviation & Missile Center

Nominated for Graduation with Distinction (DL)

Mr. James Allen Geddes, U.S. Army Combat Capabilities Development Command - Soldier Center
Mr. Jamie Calanche, U.S Army Test and Evaluation Command
Mr. Neil Olson, Naval Surface Warfare Center, Crane Division
Mr. Kieran Xavier Conley, Naval Surface Warfare Center, Dahlgren Division
LCdr Yohan Desjardins, Royal Canadian Navy

Nominated for Graduation with Distinction (Resident)

MAJ Hui Yang Chew, Singapore Army
MAJ Zhi Hao Ong, Singapore Army
Mr. He Jiang Tan, Defense Science Organization

Naval Sea Systems Command Award for Excellence in Systems Engineering (Resident)

LT Jarrod Kujawski USN

Graduations

Master of Science in Systems Engineering (DL)

LCDR Yohan Desjardins, Royal Canadian Navy
LCDR Sean T. Sullivan, USN
Mr. Samuel Cecchetti, Naval Surface Warfare Center, Carderock
Ms. Madhurima Nautiyal Cevallos, USN
Mr. Ryan Derek Cloud, Redstone Test Center
Mr. Corwin P. Coldman, U.S. Army Test and Evaluation Command
Mr. Kieran Xavier Conley, Naval Surface Warfare Center, Dahlgren Division
Mr. Tam N. Dinh, Naval Air Warfare Center Weapon Division, Point Mugu
Mr. Adam Gershen, Naval Surface Warfare Center, Carderock Division
Mr. Mark J. Haase, Naval Air Warfare Center Weapons Division
Mr. Dustin R. Head, Missile Defense Agency
Mr. Joshua A. Hersh, U.S. Army Combat Capabilities Development Command, Aviation & Missile Center
Mr. Myles Wesley Kelley, U.S. Army Combat Capabilities Development Command
Mr. Joshua Charles Kirkland, U.S. Army Combat Capabilities Development Command Aviation & Missile Center
Mr. Matthew Joseph LaPorte, Naval Surface Warfare Center, Dahlgren Division
Mr. Andrew S. Mason-Leister, U.S Army Combat Capabilities Development Command Aviation and Missile Center
Mr. John R. McDonough, Army Futures Command
Mr. Rudy M. Pascua, Naval Information Warfare Center, Pacific
Mr. Zachary H. Richards, Naval Sea Systems Command
Mr. John Bernard Ruhl, U.S. Army Test and Evaluation Command
Ms. Dayna J. Spencer, Operational Test Command

Master of Science in Systems Engineering (Resident)

MAJ Willie Clark, USA
Mr. Alvin Jin Hong Goh, Singapore Technologies Engineering
LT Avery Hill, USN
MAJ Ivan Zi Yin Ko, Singapore Army
MAJ An Song Koh, Singapore Army
LT Jarrod Kujawski, USN
ME5 Jun Jett Lim, Singapore Army
LT Andrew J. Staley, USN

Master of Science in Engineering Systems (DL)

Ms. Valeriia Laryoshyna, U.S. Army Combat Capabilities Development Command

Master of Science in Systems Engineering Analysis (Resident)

MAJ Hui Yang Chew, Singapore Army

MAJ Jun Jie Khng, Singapore Army

MAJ Zhi Hao Ong, Singapore Army

Mr. He Jiang Tan, Defense Science Organisation

Master of Science in Systems Engineering Management (DL)

Captain, USMC (Ret.) David M. Walsh, Naval Air Warfare Center Aircraft Division, Webster Outlying Field, Special Communications Mission Solutions

Ms. LaQuinta N. Andrews, U.S Army Combat Capabilities Development Command

Mrs. Monica L. Blanchard, Naval Undersea Warfare Center Division Newport

Ms. Whitley Madeline Bowman, U.S. Army Combat Capabilities Development Command - Ground Vehicle Systems Center from DEVCOM GVSC

Ms. Olivia Briscoe, Naval Air Warfare Center Aircraft Division Webster Outlying Field

Mr. Michael A. Bush, Army Contacting Command - New Jersey

Mr. Jamie Calanche, U.S Army Test and Evaluation Command

Mr. James Andrew Christophersen, U.S. Army Program Executive Office Command, Control, & Communications - Tactical

Ms. Brittney L. Cromwell, Naval Undersea Warfare Center, Division Keyport

Ms. Jaunna Rae Daugherty, U.S. Army Contracting Command - Detroit

Mr. James Allen Geddes, U.S. Army Combat Capabilities Development Command - Soldier Center

Ms. Allison Anne Gregory, U.S. Army Contracting Command - Aberdeen Proving Ground

Mr. Ryan Thomas Greenlee, Naval Surface Warfare Center, Crane Division

Mr. John J. Handrigan, Naval Undersea Warfare Center Division Newport

Mr. Matthew Hudson, Program Executive Office

Mr. Edward Morris Jeffries, U.S. Army Aviation and Missile Command

Mr. Shaun T. Jenkins, Program Executive Office Soldier

Mr. Bradley D. Johnson, U.S. Army Combat Capabilities Development Command, Aviation and Missile Center

Mr. Michael J. Licholat, Ground Vehicle Systems Center, Detroit Arsenal

Mr. Bien C. Manalo, U.S. ARMY CECOM SEC - ASSC

Mr. Neil Olson, Naval Surface Warfare Center, Crane Division

Mrs. Jennifer G. O'Rear, U.S. Army Combat Capabilities Development Command, Aviation and Missile Center

Mr. Jay Edward Richards, U.S. Army Program Executive Office Combat Support and Combat Service Support

Ms. Delaney Rose Santos, Naval Undersea Warfare Center Division Newport

Mr. Joshua E. Smothers, Army Futures Command

Mr. David Andrew Swank, Naval Surface Warfare Center, Crane Division

Mr. Jesse Lee Thompson, Naval Information Warfare Center - Atlantic, Division DC2HS

Mr. Jacob L Waters, U.S. Army Test and Evaluation Command

Mr. Gerald Todd Wyngaard, Program Executive Office Command Control Communications-Tactical

Please direct questions or comments to the SE Newsletter Editor, Chiaki Gayle, at csgayle@nps.edu

Request for Alumni News!

The SE Department is interesting in hearing how our alumni are doing.
Please feel free to send the editor news items for inclusion in future newsletters.

If you would like to subscribe to the Systems Engineering Newsletter, please click here.

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