

SYSTEMS ENGINEERING DEPARTMENT NAVAL POSTGRADUATE SCHOOL





January 2021

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December 4, 2020-Graduation in the Time of COVID: SE PhD student, Bill Anderson, at his hooding ceremony

Letter from the Chairman

Welcome to the Systems Engineering Newsletter for the year 2020. As always, there's a lot to report on our activities with educational programs, our research for the Navy and other military services, and the activities of our faculty, staff, and students. The newsletter only contains some of the highlights.

The systems engineering department continues to serve the Navy, Marine Corps, Army, and Air Force with highly relevant programs and research. One of the largest shifts in the Systems Engineering community has been the adoption of model-based systems engineering (MBSE). MBSE is part of the larger Department of Defense (DoD) vision for digital engineering within the acquisition community. We have taken actions to incorporate MBSE throughout all our courses using the tools and methods found throughout the DoD. We currently support MagicDraw, Cameo, Innoslate, Vitech Core, and Model Center's Phoenix among other tools. I represent NPS on the Navy's Systems Engineering Working Group that is helping to advance the adoption of digital engineering throughout the Navy. The faculty conduct many research projects that are advancing the theory and practice of

MBSE including work on verifying system behaviors by Professor Kristin Giammarco, work on integrating operational and physical architectures by Professor Paul Beery, and Professor Warren Vaneman's contributions to a Navy working group developing an ontology to support MBSE.

The SE department was reaccredited by ABET for our MSSE programs without any issues. This year we also obtained examination equivalency for our students taking the Fundamentals of Systems Engineering course with INCOSE (Institute of Systems Engineering) for certification as Associate Systems Engineering Professional (ASEP), which is the first certificate and recognizes individuals who are knowledgeable about SE but without demonstrated SE experience.

The SE department continues to be active lieve there is great interest by sponsors in new course development. We now offer courses in directed energy weapons, a growing area of interest to the Navy. We have a new course on industrial engineering of interest to any Naval or Army student who will work with the defense industrial base.



Ronald Giachetti, PhD Professor of Systems Engineering Systems Engineering Chair, NPS

in education programs for the Navy. Professor Wally Owen has led the effort to develop stackable certificates. We befor particular certificates, and this program will allow those students to assemble those certificates to earn a MS degree.

Discussing the year 2020 would not be complete unless we mentioned Covid-19 and how it affected us at NPS. In my opinion, the SE faculty, staff, and stu-The SE department continues to innovate dents performed great, and we seamlessly

Letter from the Chairman, continued...

shifted from in-person classes and work to a completely online education and telework situation. No doubt, SE's long experience with distance-learning education and remote faculty served us well in the transition. Of interest, Lt. Gen. Paul Ostrowski who initiated the 522 and 722 programs for Army Acquisition is now playing a prominent role as the Director of Supply, Production and Distribution

SE Spotlight

for Operation Warp Speed to develop and distribute a vaccine for Covid-19. As of the Winter 2021 quarter, NPS remains mostly in telework mode, but I expect in late Spring and/or early Summer, we will be fully returning to campus.

As a last note, the Navy is investing in NPS facilities and Bullard Hall is slated to be renovated in FY2022. We are look-

ing forward to updated physical facilities for classrooms, offices, labs, and student spaces. All are welcome to come visit when the renovation work is completed.

Best regards,

Ronald Giachetti





Picture Provided by NASA

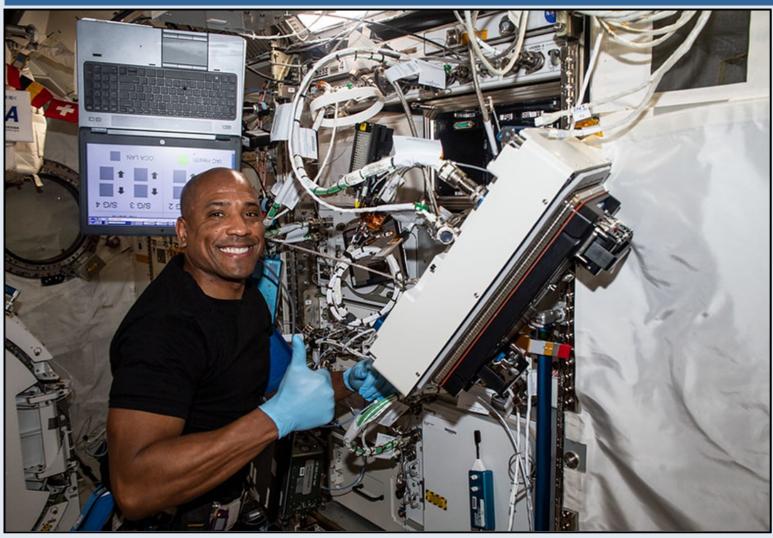
CDR Victor "Ike" Glover is our latest notable alumnus from our Systems Engineering program, graduating from the PD-21 program (Curriculum 721) in 2009.

We were very proud when NASA was selected Victor to be an astronaut in 2013, but his selection was not unexpected. IKE, a call-sign name given to him by one his commanding officers standing for "I know everything," lived up to that call sign during his studies at NPS. His thesis advisor commented, "Ike was an outstanding student. He strove to master the material in all of his courses completely. For his thesis, I gave him a few tips, a nudge here and there, and then got out of his way."

Victor and his co-author John Bush completed their thesis on the flight test of network enabled weapons, for which they earned the outstanding thesis award.

Victor is currently on-orbit aboard the International Space Station. He was pilot and second-in-command on the Crew-1 SpaceX Crew Dragon, named Resilience, which launched November 15, 2020, and will serve as Flight Engineer on the International Space Station for Expedition 64.

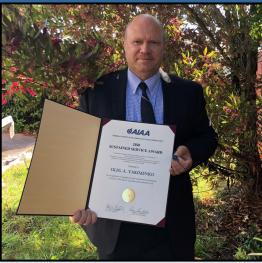
NPS Alumnus Goes to Space, Continued



Picture Provided by NASA

Faculty News

Faculty Members Recognized for Their Achievements



Distinguished Professor Oleg Yakimenko

System Engineering Department's Distinguished Professor Oleg Yakimenko was presented with the AIAA 2020 Sustained Service Award In recognition of his significant and sustained contributions to AIAA at the local, regional, and national levels.

"The Sustained Service Award is presented to recognize sustained, significant service and contributions to AIAA by members of the Institute. The nominee/recipient must be a member in good standing who has shown continuing dedication to the interests of the Institute by making significant and sustained contributions over a period of time, typically 10 years or more. Active participation and service at the local section/regional level, and/or the national level is a potential discriminator in the evaluation of candidates."

-www.aiaa.org

This is the latest recognition Professor Yakimenko has received from the AIAA. He was also awarded the Outstanding Leadership and Service Citation from AI-AA in 2008.

Faculty Members Recognized for Their Achievements, Continued



Professor of Practice Donald Muehlbach (pictured left) has been selected for the Fall Quarter 2020 Meyer Award for Teaching Excellence in Systems Engineering (Distance Learning).

This is his 21st Wayne E. Meyer Award for Excellence in Systems Engineering teaching. Since joining the SE Department in 2009, he has also garnered the following teaching awards:

- 2015 Allen Griffin Award for Excellence in Post-Secondary Teaching, Naval Postgraduate School
- 2013 Rear Admiral John Jay Schieffelin Award for Teaching Excellence, Naval Postgraduate School
- 2011 GSEAS Faculty Award for Extraordinary Merit in Teaching, GSEAS, Naval Postgraduate School
- 2011 Legion of Merit Medal, US Navy

New Faculty Join the Systems Engineering Department



Professor of Practice, Joel Hagan



COL Joyce Stewart, U.S. Army

ment in early 2020. ducting aircraft performance progressed in his Air Force Programs), test roles including the initial fense Agency. His career cul- manned and avionics development of the Defense Contract Manage- fense Innovation Unit.

Joel Hagan, retired Air Force the F-22 and F-35 fighter ment Agency in Palmdale

Colonel, joined the SE depart- aircraft. He also served in California overseeing multiple Joel leadership roles as a Test Defense contractor operations started his career in the U.S. Squadron Commander and to include Northrop Grum-Air Force serving as an Deputy Operations Group man, Lockheed Skunkworks aeronautical engineer con- Commander. Professor Hagan (now Advanced Development and General analysis and aircraft accident career holding multiple pro- Atomics. Upon retiring from investigation. In 1997, he gram management positions the U.S. Air Force in 2016 as graduated from the U.S. Air supporting the Air Force Re- a Colonel, Professor Hagan Force Test Pilot School and search Laboratory, Air Force served as a DoD contractor subsequently served multiple Space and Missile Systems conducting F-22 flight test assignments in various flight Center and the Missile De- operations and Counter Un-Aircraft Systems envelope expansion testing minated as the Commander of (CUAS) testing for the De-

Colonel Joyce Stewart, US Army, reported to the Naval Postgraduate School (NPS) in April 2020, to serve as the Military Chair of Systems Engineering & Acquisition Management for the Army Acquisition Corps within SE. As such, she is responsible to the President of Naval Postgraduate School and the Military Deputy to the Assistant Secretary of the Army for Acquisition, Technology and Logistics (ASA(ALT)) for the professional development and graduate education of Army Acquisition workforce members attending NPS, and is the primary liaison for the Army

Sponsor and DACM Office. Colonel Stewart joined NPS from the Assistant Secretary of the Army, Acquisition, Logistics, and Technology, Office of the Chief Systems Engineer where she performed as the Cyber Director. She was originally commissioned as an Air Defense Artillery officer, serving in multiple PATRIOT platoon leader positions and as her battalion S-1. Her operational assignments included multiple deployments to South Korea and to Saudia Arabia in support of Operation Desert Falcon. Following these she was assigned to her basic branch of Military Intelli-

gence, where she commanded a company in the 102nd Military Battalion in Uijongbu, Korea and was later assessed into the Army Acquisition Corps. COL Stewart's acquisition assignments have been in the Army Test and Evaluation Command, Defense Information Systems Agency, National Reconnaissance Office, US Army Materiel Command, and ASA(ALT). She holds Master degrees in Computer **Resources and Information** Management and General Business from Webster University, and a Ph.D in Organizational Management from Capella University.

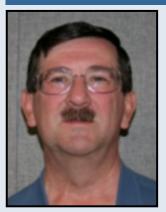
Faculty News, Continued...

Faculty Member Retires



Senior Lecturer John Dillard (pictured left) retired in 2020 after a 20-year career at NPS, which he started after a full career in the Army from which he retired as a Colonel. As a Senior Lecturer, John taught 105 course segments, mentored future flag officers such as LTG Williamson and LTG Ostrowski and guided generations of Acquisition leaders who have shaped the future of Army Acquisition. John Dillard was recognized for his service with the Navy Superior Civilian Service Award in November. We all wish him a happy and well-deserved retirement.

In Memoriam



Professor Robert Harney (pictured left) passed away after a long illness in 2020. Professor Harney was hired to stand up the combat systems portion of the Total Ship Systems Engineering program in 1995. He was an instrumental member of the team recommending the establishment of the Systems Engineering department, master's curriculum, and combat systems courses. Once the SE department was established, he played a role in standing up the distance-learning program and the PhD program. Our students will probably best remember Professor Harney from his extensive course notes on combat systems. He was a good colleague to discuss and think over a wide range of academic issues. He was definitely a bibliophile with a large collection of books, and could speak intelligently to many topics. There is little doubt that he will have a lasting influence on the many students who went through the combat systems track, and his extensive writings on the topic will continue his intellectual legacy.

Student Stories

Systems Engineering Student Wins Second Place in Mine Warfare 2020 Essay Contest **By Assistant Professor Anthony Pollman**

Systems Engineering student LT Christo- advances in technology were brought to 2020 Mine Warfare Essay Contest. Their winning entry, "Reimagining Offensive Mining: Cooperative, Mobile Mines," will be published in the January 2021 issue of USNI Proceedings. Once published, it will also be posted on ResearchGate (please take a look). In addition, they received individual plaques and shared a \$750 prize. Over 20 submissions were received for this year's contest, and the winners were announced in mid-September.

Hevey and Pollman's essay outlines what offensive mining might look like if Hevey and Pollman have been invited to

pher Hevey, and Assistant Professor bear. Part of their essay presents Anthony Pollman, won 2nd Place in the technology that was developed by Ross Eldred, and other System Engineering colleagues, under the auspices of CRUS-ER. The concept calls for a network of small mines that can communicate, maneuver, be rendered safe at a distance, and perform fish-schooling or swarming behaviors.

> These ideas continue to be explored via capstone and thesis projects, to include a distance learning capstone team lead by Assistant Professor Paul Beery and funded under the auspices of NRP.



LT Christopher Hevey

Systems Engineering Student Wins Second Place in Mine Warfare 2020 Essay Contest, Cont...

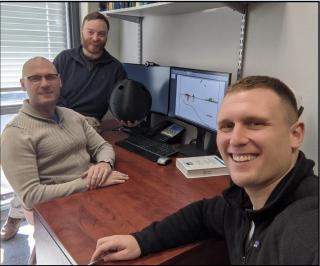
give a lecture on their concept at the upcoming Mine Warfare Symposium.

"This type of minefield would be exponentially more effective than the present way of doing business, and could have unique, disruptive capabilities like the ability to maneuver around an enemy Officer School. Hevey also while sweeper subsequently mine forming a swarm in its wake or the ability funded Ph.D.program at the to selectively allow friendly ships to pass Massachusetts Institute of while denying safe passage to enemy vessels," said Hevey.

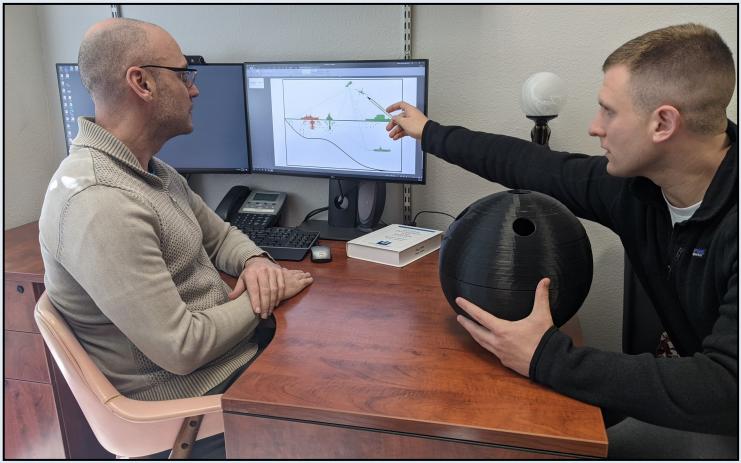
Hevey graduated, with distinction and an outstanding thesis, in December. This essay was undertaken in addition to his

thesis, which explored using Artificial Intelligence to aid hull design. His thesis advisor was Associate Professor Papoulias. Hevey will attend Dive School before reporting to the Engineering Duty applied to attend a U.S. Navy Technology, and is waiting to here the selection results.

The entire department is rooting for his selection! Go Chris, you make us proud!!



to right) Assistant Professor Anthony Pollman, Research Associate Ross Eldred and Systems Engineering Student LT Christopher Hevey.



(left to right) Assistant Professor Anthony Pollman and Systems Engineering Student LT Christopher Hevey.

In addition to winning second place in the Mine Warfare 2020 essay contest, Lt Christopher Hevey also recently presented his thesis methodology and results to a wide audience from the NPS. Naval Academy, and Navy Labs. The abstract of his Thesis, titled "Machine Learning in the Prediction of Displacement Hull Form Resistance," is below:

tis Papoulias¹, Todd Greene², Marco a significant build-up from today's 293 Orescanin¹

Naval Postgraduate School, USA;² United States Naval Academy, USA

ABSTRACT:

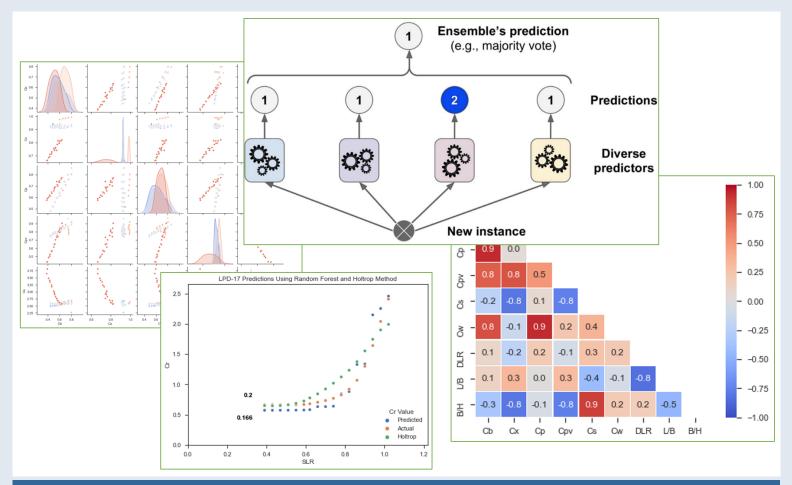
The United States Navy's stated force-

AUTHORS: Christopher L. Hevey¹, Fo- structure goal is a 500-ship fleet by 2045, ships. The expanded surface fleet will be designed to meet this goal with operational capabilities, and within operational environments, that have evolved since the last surge of naval shipbuilding in the 1980s. These new challenges will likely drive increased diversity in the design

Systems Engineering Student Wins Second Place in Mine Warfare 2020 Essay Contest, Cont...

-cients and ratios from historically tested ship hull methodical series, parametric, non-parametric, and ensemble method algorithms were trained, validated, and tested. The research analyzes the necessity of first classifying a hull design to an established methodical series prior to performing regression efforts to predict resistance. Conversely, the research also

analyzes the benefit of machine learning infancy, provides dynamic resistance preregression algorithms to predict resistance dictions that are more accurate than from an entire hull design data set, with- Holtrop's statistical method with a speed out first classifying. Finally, the research dependent form factor. Through the estabdemonstrates the power of machine learn- lishment of a shared hull form geometry ing in quickly adapting to small amounts and performance repository, the true powof additional training data to accurately er of machine learning may be unleashed, refine the predictions. The intersection of removing the most challenging of obstamachine learning and hydrodynamics is a cles associated with preliminary hull form little-explored frontier that, even in its design.



Distance Learning Student Receives Meyer Award By Brigitte T. Kwinn, Lecturer

William Emeny was selected for the Meyer Award for Outstanding Student in Systems Engineering (Distance Learning).

The Wayne E. Meyer Award for excellence in systems engineering is presented for superior academic achievement and leadership to an outstanding NPS graduate from the systems engineering degree program. Recipients are nominated by fellow classmates and the NPS Systems Engineering faculty. Only one student from each cohort is selected for this award so it is a very competitive process

and a significant honor.

The award is named for the late Rear Admiral Wayne E. Meyer, one of NPS greatest Hall of Fame Alumni.

William was the team leader for a capstone team of 6 systems engineering students from NSWC Port Hueneme Division (PHD). His leadership enabled the team to work together on a very difficult project topic provided by the NSWC PHD vision leader, Jason Bickford, also an NPS systems engineering graduate.



Pictured Above: William Emeny

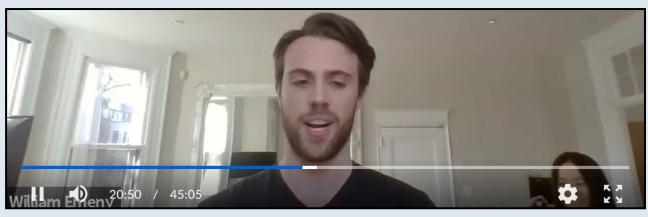
Distance Learning Student Receives Meyer Award, Cont.

The capstone project is a nine-month endeavor that ties together the courses the students completed to solve a relevant problem and provide recommendations for their command. The students completed interim progress review briefings to the stakeholders and the faculty. The capstone culminated in a published report.

The team called themselves the A Team and consisted of William Emeny, Lance

Lowenberg, Lynn Nguyen, Ryan Robar, Michael Rubow and Dustin Talley. Their language (SysML) and object-oriented report titled "The Application of Model-Based Systems Engineering for Capability Development and Assessment" was designated "Outstanding Thesis" by NPS for the team's contributions and advancements of theory and application in the field.

The project laid the foundation for a conceptual system model development process that utilizes the systems modeling systems engineering methods (OOSEM) to produce system model data and artifacts. The findings and developments of this capstone enable NSWC PHD to standardize the way system modeling data is developed, collected, and communicated to other systems external to the engineering domain.



Pictured left: William Emeny at the Systems Engineering 2020 Fall Quarter Graduation Ceremony. Ceremony was conducted via Zoom for Government due to COVID-19 restrictions.

Capstone Corner

Fall Quarter Capstone Competition Winner By Joseph Sweeney, Lecturer

On December 16, 2020, Dr. Ronald Giachetti, the Chair of the Systems Engineering Department, recognized the winning team of the Army's System Engineering Management (Curriculum 522) Capstone Competition: Major Ted Cha, Captain Blake A. Davis, Captain Zachariah R. Shutte, Captain Douglas J. Snodgrass, Major Christopher J. Wimsatt, and Major Rene (Ray) Ybarra.

Each team member received a certificate signed by the Systems Engineering Chair and Mr. Craig Spisak, Director of the Acquisition Career Management Office. Each member also received an Acquisition Corps coin and had their name engraved on the perpetual plaque recognizing Capstone Competition winners.

The Capstone Competition is the centerpiece of the Systems Engineering Management program. Each project is based on a real-world problem with an actual customer awaiting a solution. Capstone teams are required to apply systems engineering and management techniques and

processes. At the end of their graduation quarter, every cohort presents their unique problem, methodology, and solution. A panel of judges assesses each team's competence in applying the skills promoted in the 522 program and the project outcome's value to the customer.

The Fall quarter winning team competed against three other groups that presented projects involving soldier borne sensors, requirements analysis for a cross-reality system, and the development of a structured process for stakeholder management.

The winning capstone project assisted the Joint Special Operations Command (JSOC) to methodically and quantitatively select an appropriate gaming engine for a mixed reality (MR) planning and rehearsal system. Current technology offers a means to satisfy JSOC's continuing need to visualize the operating environment prior to mission execution. Advances in three-dimensional visualization of the operating environment promise U.S.

forces a comparative advantage. An essential component of the MR system is the gaming engine. Procurement of the gaming engine depends on the pool of commercially available engines. As such, JSOC required a systematic, data-driven approach for selecting the appropriate gaming engine.

The capstone team developed a structured approach to assess different MR gaming engine alternatives. Using multi-objective decision analysis and additive value modeling, the research team produced a credible, repeatable, traceable selection process to compare alternatives. While the methodology was developed specifically for the MR gaming engine, the mathematical foundation that the team built was robust enough to apply to different systems that JSOC may procure in the future. The sponsor's representative, Ms. Laura Cowdrey, stated that the team's work had driven JSOC to re-examine its selection process. This persistent, tangible effect is the goal of the team's capstone effort.

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Fall Quarter Capstone Competition Winner, Continued...



Major Cha (left) and Major Wimsatt (right) representing the entire winning team and displaying the perpetual plaque.



SE Faculty congratulate the winning team -Left to right, COL (Ret) Alejandro Hernandez, Systems Engineering Chair Ronald Giachetti, Lecturer Joseph Sweeney, Major Wimsatt and Major Cha.

Resilience in a Major Conflict By LT Collin Hust and LT Alexander Kavall

The Systems Engineering Analysis (SEA30) capstone team in collaboration with the Temasek Defense Systems Institute (TDSI) cohort, is tasked with analyzing resilience in a major conflict, specifically the backwards extension and redefining of the "kill chain" to include all possible processes from metal bending to metal delivery. The association of a "kill chain" is tied to the commonly accepted and practiced Surface Warfare (SUW) and Air Warfare (AAW) methodologies of F2T2EA (find, fix, track, target, engage, assess) and DTE (detect, track, engage).

The support of these kinetic kill chains was analyzed by a previous cohort, which had the goal of "designing a cost effective, deployable and resilient unmanned and manned system of systems to provide logistics in contested environments by

near peer competitors in the 2030-2035 timeframe."

The current team focuses on the nonkinetic kill chain, the "industrial kill chain" discussed during the Warfare Innovation Continuum (WIC) which allows the United States Navy to have a kinetic kill chain at sea. Our diverse team, represented in Figure 1, aims to use set-based design to analyze a critical mission component and trace back the elements required for mission success to pinpoint vulnerabilities in the process up to delivery to the pier.

The current focus of the team is on the mining, processing, stockpiling, and foreign reliance of the United States of rare earth elements (REEs) which make up electronics within our weapons systems.

The refined problem statement is to "increase the resilience of the operational supply chain to ensure continuous operational output in the face of an extended conflict with other global powers." This is aimed at the U.S. reliance on REEs sourced from near-peer competitors and the stranglehold those competitors can impose on the market which would effectively cripple the U.S. ability to sustain the fight.

Some of the additional assumptions that the team has made are included below:

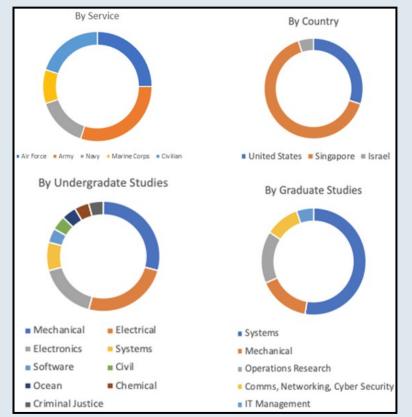


Figure 1: SEA30 Capstone Team

	Issue	Assumption		Issue	Assumption
1	Rank importance of capabilities needed in the "kill chain"	ISR & Cyber-Warfare Weapon Systems Persistent monitoring capabilities	5	How the USN sees regional allies and strategic partners as part of the solution, continued	75%: Allied engage- ment/collaboration with equal USN involvement
2	What is a realistic budget to constrain our solutions	50%: <us\$10b 20%: US\$50-59B 15%: US\$10-19B 10%: US\$20-39B 5%: >US\$100B</us\$10b 	6	Should the eventual "sensitivity analysis" be focused on varia- bles which are within US- N/DoD's scope of influence or Industry-wide/National scope of influence? Rank the top 3 areas of Naval	40%: Within DOD's scope of influence 40%: Across commercial industries/national effort 20%: Within USN's scope of influence Anti-submarine
3	Top 3 effective ways of incen- tivizing a skilled USN mainte- nance force	Increase number of sailors attending technical insti tutes for learning Restructure current shore- maintenance tours to make them competitive Increase bonuses for reten- tion of skilled sailors	8	Rank the following spheres of influence that an adversary's control of rare earth element has. Rank the following areas of	Electronic Ballistic missile de- fense Political Concern Military Concern Industry Concern Cyber warfare
4	USN preference to in- sourcing/outsourcing mainte- nance How the USN sees regional allies and strategic partners as	80%: Insourcing 20%: Outsourcing 75%: Allied engage- ment/collaboration with equal USN involvement		concern that the USN would have by 2035	ASW SUW AAW
	part of the solution.		1 0	Rank the reliance of the follow- ing industries on foreign compa- nies/stakeholder	Others Mining Electronics Oil/Energy Metal Fabrication

Resilience in a Major Conflict, Continued...



LT Collin Hust



LT Alexander Kaval

If you would like further information or wish to offer your feedback, please e-mail the team leads, LT Collin Hust (collin.hust@nps.edu) or LT Alexander Kavall (alexander.kavall@nps.edu).

Awards and Graduations

Awards

Naval Sea Systems Command Award for Excellence in Systems

LT Christopher Hevey, USN

The Surface Navy Association's Award for Excellent in Surface Warfare Research Engineering

LT Christopher Hevey, USN

Meyer Award for Outstanding DL Student in Systems

Mr William Patrick Emeny, Navel Surface Warfare Center, Port Hueneme Division

Meyer Award in Systems Engineering for DL Teaching

CAPT Donald Muehlbach PhD, USN (ret)

Systems Engineering Management Capstone Competition

522-194 Team Mixed Reality Comparison

Capstone Title: A Systems Engineering Approach to Comparing Mixed Reality Gaming Engines within the DOD

<u>Members</u>: MAJ Ted Cha, CPT Blake Davis, CPT Zack Shutte, CPT Doug Snodgrass, Major Chris Wimsatt, and Major Ray Ybarra

Advisors: Alejandro Hernandez, Joseph Sweeney, and Douglas Van Bossuyt

Outstanding Thesis

LT Christopher Hevey, USN, LT Joshua Hildebrand, USN, and LT Katherine Irgens, USN

Awards, continued

Outstanding Capstone Report

311-192S Team A

Capstone Title: A Study of MBSE Through the Development of Modeling and Data Exchange Processes

Members: William Emeny, Lance Lowenberg, Lynn Nguyen, Ryan Robar, Michael Rubow, Dustin Talley

Advisor: Brigitte Kwinn

Recommendation for Graduation with Distinction

LT Christopher Hevey, USN ; LT Joshua Hildebrand, USN; Mr. Antoin J. Abboud, Naval Surface Warfare Center, Port Hueneme Division; Mr. Dustin Gregg Tally, Naval Surface Warfare Center, Port Hueneme Division

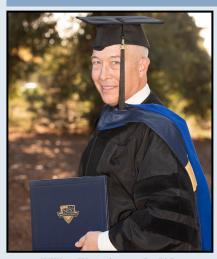
Graduations

Mr. William W. Anderson, Jr., Naval Facilities Engineering Systems Command, Engineering and Expeditionary Warfare Center

William Anderson was awarded the PhD in Systems Engineering in December 2020 for his work developing a model to analyze the resilience and cost of microgrids on islanded Naval bases. Bill's dissertation work contributes to our understanding of the resilience of microgrid architecture alternatives, and the tool he developed can be used by base commanders to generate the trade space for resilience and costs. His work is contributing to an ongo-

ing project at NPS on energy security with application at the Rota Naval Base.

Doctor of Philosophy in Systems Engineering



William W. Anderson, Jr., PhD

Master of Science in Systems Engineering

LT Christian Diaz, USN

LT Christopher Lawrence Hevey, USN

LT Joshua P. Hildebrand, USN

LT Katherine E. Irgens, USN

LT Andrew Wiley Miller, USN

Mr. Antoin J. Abboud, Naval Surface Warfare Center, Port Hueneme Division

Mr. Daniel Wade Carter, U.S. Army Combat Capabilities Development Command Aviation and Missile Center

Mr. Cedric T Chiu, Naval Sea Systems Command, Port Hueneme

Mr. William Patrick Emeny, Naval Surface Warfare Center, Port Hueneme Division

Ms. Katrina M. Granada, Naval Surface Warfare Center, Port Hueneme Division

Mr. Timothy Owen Hillman, 96th Test Wing Eglin Air Force Base

Mr. Alex Robert Kemeny, Naval Sea Systems Command

Graduations, Continued...

Master of Science in Systems Engineering, continued

Mr. Edwin Rafael Laboy Perez, Naval Surface Warfare Center Mr. Lance Lowenberg, Naval Information Warfare Center Pacific Mr. Roianthony Corpuz Navarro, Naval Surface Warfare Center Port Hueneme Division Mr. Michael Horst Rubow, Naval Surface Warfare Center, Port Hueneme Division Mr. Wesley C Sanders, Naval Surface Warfare Center, Port Hueneme Division Mr. Jacob Scott Shadle, Naval Sea Systems Command Mr. Harsh Kalpesh Shah, Naval Surface Warfare Center, Port Hueneme Division Mr. Dustin Gregg Talley, Naval Surface Warfare Center, Port Hueneme Division Ms. Victoria C Tsugawa, Naval Surface Warfare Center, Port Hueneme Division

Master of Science in Engineering Systems

Ms. Lynn Phuong Nguyen, Naval Surface Warfare Center, Port Hueneme Division Mr. Ryan Christopher Robar, Naval Surface Warfare Center, Port Hueneme Division

Master of Science in Systems Engineering Management

MAJ Robert D. Allen, USA MAJ Mitchell J. Boatwright, USA MAJ Joe Callaghan, USA MAJ Ted Lee Cha, USA MAJ Catherine L. Collinsworth, USA CPT Blake A. Davis, USA MAJ Oscar Delgado, USA CPT Nicholas J. Grazer, USA MAJ Michael Ryan Griffin, USA MAJ Monica Michelle Holmes, USA CPT Shad Hughes, USA MAJ James A. Jones, USA MAJ Sean S. McCune, USA CPT Joshua Kain McMillion, USA CPT John Pfiester, USA CPT Chummie S. Recel, USA MAJ Joshua A. Redmond, USA CPT Zachariah R. Shutte, USA CPT Douglas J. Snodgrass, USA MAJ Alan Joaquin Villanueva, USA MAJ Christopher J. Wimsatt, USA MAJ Ray Ybarra, USA

Mr. Andrew George Liehr, Naval Surface Warfare Center Indian Head Explosive Ordnance Disposal Technology Division **Request for Alumni News!**

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

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

Please direct questions or comments to the SE Newsletter Editor, Lorene Barnes at Lorene.Barnes@nps.edu

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This newsletter is a quarterly publication of the Department of Systems Engineering, NPS. Its contents do not necessarily reflect the official views of the U.S. government, the Department of Defense or the U.S. Navy, nor does it imply endorsement thereof. Information may be subject to change without notice.



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