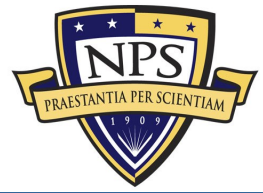




# SYSTEMS ENGINEERING DEPARTMENT

## NAVAL POSTGRADUATE SCHOOL



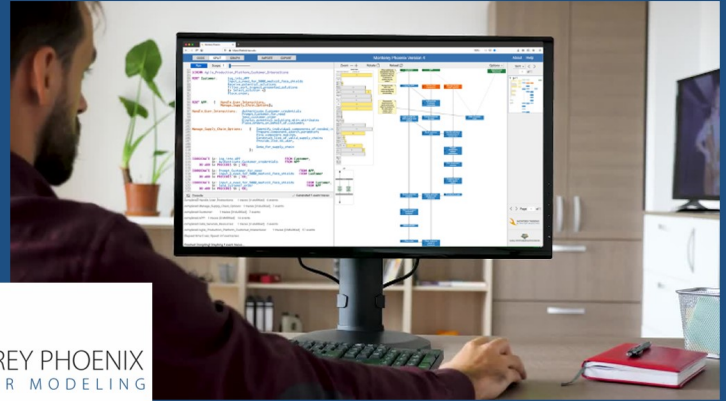
### SYSTEMS ENGINEERING NEWSLETTER

December 2022

#### In This Issue:

- SE Spotlight
- Faculty News
- Student Stories
- Alumni Update
- Capstone Corner
- Fall Quarter Awards and Graduations

Your system or process may be primed to behave in ways you never imagined or intended. Find and fix unexpected behaviors lurking in your design with Monterey Phoenix (MP), a user-friendly, NPS-developed language, approach and tool for modeling and reasoning about behavior.



<https://nps.edu/mp>

## Letter from the Chairman

Welcome to the Systems Engineering Newsletter for the fall quarter of the 2023 Academic Year!

This quarter we continued to operate in the in-person mode and had a full-fledged graduation with students, their families (including many children), faculty, staff, and guests attending the summer commencement ceremony at King Hall on December 16<sup>th</sup>. The commencement address was given by the Honorable Carlos Del Toro, Secretary of the Navy. As usual, two days before graduation, the SE department held the hybrid Student Celebration Ceremony.

This time, the SE Department graduated 56 students: 1 PhD in Systems Engineering (Mr. Daniel Herrington, OSD), 28 with Master of Science in Systems Engineering, 1 - Master of Science in Engineering Systems, and 26 - Master of Science in Systems Engineering Management.

Four students graduated with distinction, one thesis student and four capstone teams were recognized for their outstanding thesis/capstones. Several SE students were recognized with other awards: the Naval Sea Systems Command Award for Excellence in Systems Engineering (LCDR Christofer Fackrell, USN), Chief of Naval Research Award for Excellence in Robotics and Autonomous Systems Research (LT Chase Smeeks, USN and LT Angelia O'Toole, USN), and Meyer Award for Outstanding DL Student in Systems Engineering (Mr. Thomas Michael Buetow, Naval Surface Warfare Center, Crane Division, and Mr. Larry D. Mannings, Naval Undersea Warfare Center, Division Newport). Three faculty members were recognized with the Meyer Award in SE for DL teaching (Douglas Van Bossuyt, Rama Gehris and Corina White).

In the fall quarter, SE faculty delivered 32 resident and DL sections, advised 12 capstone project teams and 5 thesis students, continued advising Ph.D. students, served on a variety of departmental and schoolwide committees, and worked on the reimbursable research projects. Our own Senior Lecturer Mike Green defended his PhD dissertation at the Southern Methodist University.

In October, SE completed a review of our 522 and 722 curricula. We revitalized our Systems Engineering Colloquium and had a very interesting visit to Joby Aviation, a U.S. venture-backed aviation company, developing an electric vertical take-off and landing aircraft that it intends to operate as an air taxi service.

I would like to conclude with thanking every past and current member of the SE department for your contributions and congratulating our fall graduates and their families yet again! Well done! Have a wonderful Holiday Season!



Systems Engineering Chairman  
Dr. Oleg Yakimenko

## Trip to the Aircraft Carrier Abraham Lincoln, CVN 72

During the first week of the Fall quarter, a few NPS faculty including three SE faculty had an opportunity to take a 2-day trip to the aircraft carrier Abraham Lincoln, CVN72. These were to very busy days to better understand what it is like to serve and live on a ship. Beyond learning quite a few things specifically related to Naval Weapon Systems Engineering, the SE team was very pleased to meet and hear about the successes of our alumni at almost every unit on the ship and onshore



From left to right: Dr. Ronald Giachetti, Dr. Oleg Yakimenko, CDR (now CAPT) Loren "Wookie" Jacobi (the SEA program graduate), and Dr. Bonnie Johnson





## Bullard Hall Renovation Progress Update

Heffler Contracting Group, the prime contractor for the Bullard Hall renovation project, hosted a tour on 7 December for key NPS leaders to update them on the progress that has been made to date. Approximately 95% of the demolition efforts have been completed. Visitors had access to both the first and second floor to view the work in progress. The second floor is farther along with most of the main utility runs and drops (plumbing, power, HVAC) being installed along with the framing for the office and classroom spaces. The first floor is a little behind that as they had to cut out significant parts of the concrete floor to reroute the entire wastewater and sewage systems for the building. That was completed and the concrete flooring patches were poured on 6 December. They expect to begin the utility runs and start framing the first floor in the next few weeks. They did find funding (~ \$800K) to replace the roof and the roofing contractor has been busy removing most of the old roof and doing temporary roofing and waterproofing in preparation for full replacement. There has been little change in the status of the original long lead time equipment on the critical path (HVAC Chiller and Building Transformer) that has delayed projected completion and occupancy. However, a new item (replacement windows) may push completion even further to the right. Bottom line, Bullard Hall has been designated a Historical Building (as has Spanagel, and Root) and therefore the replacement windows must conform to the original design in appearance as much as possible. Window construction techniques have advanced significantly from the original wood and metal versions used in 1950. The current extruded aluminum techniques are difficult to modify to match the existing aesthetic. Finding a company that has the capability and capacity to do it (they are all “custom”) and also meet production deadlines for installation and occupancy is a challenge. The current projection for completion is October of 2023, but if there were further delays, and were not able to fully occupy the building until early 2024. VADM (Ret) Rondeau was adamant that we would not occupy the building with any interim or temporary fixes (like generators for power until the transformer is installed).





## SE to the rescue: NPS is Helping Marine Corps Base Miramar with Workforce Optimization

Dr. Johnson, Dr. Madachy, and Dr. Green just kicked off a project to help USMC Air Station Miramar by studying their military and civilian workforce requirements in support of Fleet Marine Forces. The team will develop a resource and cost model and analyze alternative workforce strategies. Pictured in the photo from left to right: LtCol Robert Weingart, USMC (Miramar Plans Officer), Dr. Bonnie Johnson, Dr. Raymond Madachy, Dr. Mike Green, and Col Thomas Bedell, USMC (Miramar Commanding Officer).



## NPS faculty visit current and alumni SE students at NUWC

Dr. Bonnie Johnson is working on a project to automate wargaming adjudication at the Naval War College. While recently working in Newport, R.I., she was able to meet with alumni and current NPS SE students from the Naval Undersea Warfare Command (NUWC). Pictured from left to right are: Mr. Scot Miller (NPS Information Sciences), Mr. Arkady Godin (NPS Information Sciences), Rachel Badalyan (NUWC and NPS SE alumni), Sarah Brown (NUWC and current NPS SE student), Jamie Donais (NUWC and current SE student), and Dr. Bonnie Johnson.

Dr. Johnson and her Information Science colleagues are working on a Naval War College project that builds on Rachael Badalyan's capstone research project. Rachel worked with three teammates (Andrew Graham, Michael Nixt, and Jor-El Sanchez) to study an Application of an "Artificial Intelligence-enabled real-time wargaming system for naval tactical operations." This team graduated in June 2022.

Jamie Donais and Sarah Brown are working with three other students (Joshua Denney, Kory Hughs, and Andrew Kurdziel) on a directed energy project focused on high power microwave (HPM) weapons. This team is analyzing strategies to protect naval UAVs operating within range of HPM threats.





## Student Stories

### Naval Proceedings Published the Work of LT Chase Smeeks

*Naval Proceedings* recently published the work of LT Chase Smeeks, a graduate of the Naval Postgraduate School's systems engineering program. LT Smeeks earned his Master of Science degree in Systems Engineering in December 2022. His article, titled "[Reimagining Logistics to Enable Distributed Lethality](https://www.usni.org/magazines/proceedings/2023/january/harvest-hydrogen-distributed-logistics)" <https://www.usni.org/magazines/proceedings/2023/january/harvest-hydrogen-distributed-logistics>

is based on his master's thesis research with his advisors Dr. Anthony Pollman, Dr. Douglas Van Bossuyt, and Dr. Anthony Gannon. Dr. Pollman additionally co-authored this article. The intention of this work was to expand on previous alternative energy research into microgrids and hydrogen conducted at NPS by his advisors. The purpose of this research was to develop a set of operational scenarios for hydrogen-powered unmanned aerial vehicles (UAVs) that demonstrate the plausibility, advantages, and implementation barriers of hydrogen as an alternative fuel source for a variety of naval operations. These operational scenarios are presented as a high-level operational concept graphic (OV-1), systems modeling language (SysML) sequence diagram, and written description to help decision-makers best visualize the advantages and barriers to implementation of hydrogen in each scenario.

graduate from the United States Naval Academy with a Bachelor of Science in Systems Engineering and a focus on robotics and control systems. He has a wife, Lindsey, who is also from Taylorsville, NC. Additionally, he has two children including his two-year-old son, Chandler, and his daughter, Lola, who turns one year old on December 21. He began his military career as a Surface Warfare Officer with sea tours aboard USS AMERICA (LHA 6) as the electrical officer and onboard USS NEW YORK (LPD 21) as the anti-terrorism officer. While on LPD 21, he was accepted for lateral transfer to the Engineering Duty Officer (EDO) community and received orders to the Naval Postgraduate School. He is currently serving as a project officer at Naval Information Warfare Center Atlan-



LT Chase Smeeks

## Alumni update

### Systems Engineering Graduate's Article On Experimental Validation of Resilience Models for Microgrids Published

A recent graduate of the systems engineering program, MAJ Justin He of the Republic of Singapore Air Force (RASF) recently had an article based on his master's thesis research published in the journal *Systems*. In his article, MAJ He conducted experimental validation of two microgrid resilience models previously developed at the Naval Postgraduate School by systems engineering master's and PhD students. MAJ He used an NPS experimental microgrid sited at the NPS Golf Course Annex Labs to conduct his validation experiments. Validating the two microgrid resilience models helps to build trust in the models for Navy base energy managers who are starting to use tools based upon the models to improve base energy resilience.

Military Expert 5 (ME5) MAJ Justin He started his career in the RASF in 2004 as a maintainer of F16 Communications and Navigations systems. He then attained a Bachelor of Engineering in Electrical and Electronic Engineering in 2011 and served as Officer Commanding for Radar Systems Flight which provides operational engineering support for the RSAF ground based air defense radar systems. He is thankful for the wide-ranging experience in his career thus far, and NPS SE course has prepared him well for the next phase of his career in providing engineering support for the G550-AEW Airborne Mission Suite. MAJ He was co-advised by Dr. Douglas L. Van Bossuyt and Dr. Tony Pollman.

## Graduating SE Student Given Provisional Patent for Published Work



LCDR Chris Fackrell

A portion of LCDR Chris Fackrell's thesis work was published in the Multidisciplinary Digital Publishing Institute's (MDPI's) *Inventions* Journal. His article, titled "Experimental Assessment of a Novel Dual Opening Dewar for Use on a Liquid Air Energy Storage System Installed on Remote, Islanded, Renewable Microgrids," <https://doi.org/10.3390/inventions7040101> was co-authored with his thesis advisors Dr. Pollman, Dr. Van Bossuyt, and Dr. Gannon, and will be the cover article for issue 4 of the journal. This work explored the use of different configurations and materials for creating a Dewar specifically designed to be coupled with a cryogenic power recovery cycle. Findings from this research led to US Patent Application 63/343,020, 2022, for a "Two Opening Dewar with Desiccant Annulus."

LCDR Fackrell is the Fall 2022 recipient of the Naval Sea Systems Command Award for Excellence in Systems Engineering. He holds a Bachelor of Science degree in Radiation Health Physics from Oregon State University (2011) and a Master of Engineering Management from Old Dominion University (2018). LCDR Fackrell enlisted in the Navy 2005 and was commissioned in 2011. He served as the Navigator and Operations officer aboard the *USS South Dakota* (SSN 790) prior to reporting to NPS. Having laterally transferred to the Engineering Duty Officer (EDO) community in 2020, his next tour will be at Naval Program Management Office, Strategic Systems Program (NAVPMOSSP) Flight Systems command in Littleton, CO, as a Program Lead.

## Systems Engineering Department Well-Represented at Quarterly NPS Awards Ceremony

Several graduating systems engineering students and three faculty from the systems engineering department were recognized at the NPS quarterly awards ceremony on the Quarter Deck in Herrmann Hall in December. LCDR Christofer Fackrell received the Naval Sea Systems Command Award for Excellence in Systems Engineering. LT Chase Smeeks received the Chief of Naval Research Award for Excellence in Robotics and Autonomous Systems Research. Mr. Thomas Michael Buetow, Naval Surface Warfare Center, Crane Division, and Mr. Larry D. Mannings, Naval Undersea Warfare Center, Division Newport both received the Meyer Award for Outstanding Student in Systems Engineering (Distance Learning). Professors Rama D. Gehris, Corina L. White, and Douglas L. Van Bossuyt received the Meyer Award for Teaching Excellence in Systems Engineering (Distance Learning). Local award recipients enjoyed camaraderie on the Quarter Deck following the well-attended ceremony. Congratulations to all awardees on their well-deserved recognition!



From left to right Dr. Douglas L. Van Bossuyt, LCDR Christofer Fackrell, LT Chase Smeeks, Dr. Oleg Yakimenko celebrate the success of department staff and faculty after the quarterly NPS Awards Ceremony on the Quarter Deck



## Fall 2022 Systems Engineering Students Present Their Research at Department Seminar

Five Navy officers recently presented their thesis research at the Systems Engineering department seminar series managed by Dr. Ron Giachetti. The students conducted research over the past year in several topic areas including hydrogen-powered unmanned aerial vehicle scenario development and analysis for Naval vessels, liquid air energy storage for islanded Naval microgrids, virtual reality / augmented reality training systems for the US Navy and US Coast Guard, and verification and validation of decision aid models for airframes with NAVAIR. The students' theses will be made available in the NPS Library's Calhoun Collection approximately three months after graduation. For more information or if you are interested in presenting at the Systems Engineering department seminar series, please contact Dr. Ron Giachetti [regiache@nps.edu](mailto:regiache@nps.edu)



From left to right:

LT Jasmine Sweet

Thesis title: VERIFICATION AND VALIDATION OF PERFORMANCE METRIC MODELS DEVELOPED BY NAWCAD

Advisor: Douglas L. Van Bossuyt, Co-Advisor: Ron Giachetti

LT Denntrick Horton

Thesis title: VERIFICATION AND VALIDATION OF NAVAL AIR WARFARE CENTER AIR DIVISION (NAWCAD) F/A-18 TIME-MACHINE MODEL

Advisor: Douglas L. Van Bossuyt, Co-Advisor: Ron Giachetti

LT Steven Arnold

Thesis title: VIRTUAL AND ARTIFICIAL REALITY (VR/AR) APPLICATIONS FOR UNITED STATES COAST GUARD

Advisor: Douglas L. Van Bossuyt, Co-Advisor: Amela Sadagic

LCDR Christofer Fackrell

Thesis title: EXPERIMENTAL ASSESSMENT OF A NOVEL DUAL OPENING DEWAR FOR USE ON A LIQUID AIR ENERGY STORAGE SYSTEM INSTALLED ON REMOTE, ISLANDED, RENEWABLE MILITARY MICROGRIDS

Advisor: Anthony Pollman, Co-Advisors: Anthony Gannon, Douglas L. Van Bossuyt

(not pictured)

LT Frank Chase Smeeks

Thesis title: DEVELOPMENT OF OPERATIONAL SCENARIOS FOR HYDROGEN-POWERED UNMANNED AERIAL VEHICLES IN NAVAL APPLICATIONS

Advisor: Anthony Pollman, Co-Advisors: Anthony Gannon, Douglas L. Van Bossuyt

## December Student Meyer Award 311-192N

Mr. Tom Buetow is an Electrical Engineer at NSWC Crane, specializing in rapid prototyping and development of advanced electronic warfare concepts. This includes the design and use of in-house developed software defined radios to prototype and test techniques and capabilities for ONR, USMC, AFRL, DARPA, and the Crane S&T community, among others. He graduated with a BS in Electrical Engineering from Rose-Hulman Institute of Technology in 2008. He lives in Bloomington, Indiana with his wife, Kenzie, and two young children, Aiden and Nathaniel.



Tom Buetow

NPS accomplishments/highlights (ditto if I need to change voice or style):

During the capstone project, I got a chance to marry SE principles with our Agile development processes at work. This allowed my capstone team to select a modern software-oriented approach to our SE processes in our capstone project and has given me the skills and experience to take relevant SE processes back to my team at Crane, especially for early design and architecture development.

## December Student Meyer Award 311-212O



Larry Mannings

Larry Mannings joined Naval Undersea Warfare Center (NUWC) in August 2007. He is assigned to Code 60E, Undersea Warfare (USW) Mission Engineering and Analysis. He currently serves as a member of NUWC USW Mission Engineering Team, providing Model-Based Systems Engineering (MBSE) support to USW integration with the Distributed Maritime Operations (DMO) concept. Prior roles included Lead USW Systems Engineer for Program Executive Office Integrated Warfare Systems - Undersea Systems (PEO IWS 5.0), Lead Systems Engineer for AN/SQQ-89 installations on new construction ships, and Surface Ship USW In-Service Support engineer.

Mr. Mannings is a former naval officer with over six years of service in the Surface Warfare community. His tours include Damage Control Officer on the USS HAWES (FFG-53) in Norfolk VA, Asst. Operations Officer for Destroyer Squadron Fifty in Manama, Bahrain and Executive Officer for Naval Reserve Center Quincy in Quincy, Massachusetts.

Mr. Mannings graduated from University of Rhode Island with a MS in Electrical Engineering in 2007. He obtained his BS in Electrical Engineering at Illinois Institute of Technology in 1998. Additional academic achievements include attaining an MA in Engineering Acoustics at Naval Postgraduate School in 2013 and the Naval Postgraduate School ASW Certificate in 2010.

He currently resides in Providence, RI with his wife Carla and two children Javon and Kaiden. His hobbies include running, reading, and games/puzzles.



## ASME JAVS publishes Former NPS 580 Student's Thesis and Advanced Studies Work

The Journal of Autonomous Vehicles and Systems (JAVS), a peer-reviewed research and engineering focused technical journal produced quarterly by the American Society of Mechanical Engineers (ASME), recently published the work of former Naval Postgraduate School Systems Engineering department graduate LCDR G. Vanessa Anuat in the April 2022 issue. The article, "Effects of Body Geometry and Propulsion Type on Unmanned Underwater Vehicle Interactions with Marine Vegetation," by G. Vanessa Anuat, Joseph T. Klamo, and Anthony G. Pollman (ASME. J. Auton. Veh. Sys. 2(2): 021002, April 2022; DOI: 10.1115/1.4055083), is based on the collective work LCDR Anuat did for her thesis research and advanced studies course as part of the Master of Science degree in Systems Engineering for the 580 program. Her work was co-advised by Drs. Klamo and Pollman.

LCDR Anuat's effort was part of a larger project funded through the Naval Research Program (NRP) and sponsored by the U.S. Fleet Forces Command (USFF) Navy Expeditionary Combat Command that focused on underwater vehicles operating in the shallow waters of the littoral regions. The initial goal of the effort, set by USFF, was to investigate differences in the likelihood of propeller entanglement with marine vegetation between a traditional torpedo-shaped propeller driven underwater vehicle and a biologically inspired underwater vehicle driven by a flapping tail fin. LCDR Anuat's thesis work, which specifically focused on a box-shaped remotely operated vehicle (ROV) from Blue Robotics, was significant because it demonstrated that entanglement and blockage of the vehicle itself also poses a risk to mission completion for some vehicles and that the initial number of vehicle shapes considered by the effort was too small. In her journal publication, LCDR Anuat combined her thesis research using ROVs along with previous research conducted in the Systems Engineering department. She integrated the previous thesis work of LT Katherine Irgens, that specifically focused on a REMUS-100 underwater vehicle and previous faculty research conducted in collaboration with Boston Engineering involving the bio-inspired GhostSwimmer vehicle. LCDR Anuat's journal publication highlights that both propeller and vehicle entanglements with marine vegetation need to be considered when selecting an underwater vehicle for a shallow water mission and that all three underwater vehicle shapes currently utilized by the Navy are susceptible to some type of entanglement.

LCDR Anuat is currently performing her Engineering Duty Officer (EDO) Qualification tour at the Norfolk Naval Shipyard as the zone manager for the hatch and sail teams on USS Toledo (SSN-769). Prior to NPS, LCDR Anuat had multiple tours including a Surface Warfare Officer (SWO) qualification tour on USS Nicholas (FFG-47), power school and prototype nuclear training at Goose Creek SC, and a nuclear Surface Warfare Officer (SWO(N)) qualification tour on USS George Washington (CVN-73).

## SE Students and Faculty Tour Joby Aviation in Marina, CA

About twenty Systems Engineering students and five faculty toured the Joby Aviation facilities in Marina, CA on November 18<sup>th</sup> as part of the colloquium series. Joby Aviation is developing an all-electric vertical takeoff and landing (eVTOL) aircraft. In Marina, they have their prototype aircraft that is currently undergoing flight testing. We had the opportunity to see the plane take off and land. For testing, the plane is uninhabited and the pilot is on the ground controlling it remotely. A unique aspect of the aircraft is Joby designed it to minimize noise because their business plan is to use it as an air taxi in cities and populated areas.

We were able to tour their manufacturing facilities where they build and assemble the planes. The plane is mostly made of carbon composites, which they lay up in their facilities. The metal components are mostly titanium, and many of the parts are 3D printed. We also toured their integration test laboratory and the flight simulator. All the students and faculty who were able to fly on the flight simulator were able to safely take off and land.

The tour was organized by Dr. Ron Giachetti with special appreciation for Scott Giles who is now employed at Joby. The tour was a valuable exposition of a company developing a new technology, and we were able to see the engineering that goes into the entire design process as well as the manufacturing process.

# Capstone Corner

## Total Ship Systems Engineering Capstone Team Proposes Hydrogen-Based Fuel-Producing Carrier

The 2022 Total Ship Systems Engineering Capstone Team consisting of nine students from the Systems Engineering, and Mechanical and Aerospace Engineering Departments recently briefed stakeholders on their proposed USS Thomas A. Edison CVT-1 design. Stakeholders include the Naval Research Lab, Nav Sea 05, NSWC Carderock, and others. The team was tasked with designing an energy independent aircraft carrying vessel capable of producing, storing, and transferring hydrogen-based fuel to sustain extended strike group operations in support of Distributed Maritime Operations. They developed the USS Thomas A. Edison CVT-1 design which uses a lead-cooled nuclear reactor as a power source, and manufactures hydrogen-based fuels using a proposed synthetic fuel plant design from the Naval Research Lab that extracts hydrogen and carbon dioxide from seawater. The fuels are stored aboard and can be used to fuel a small embarked air wing, and refuel a strike group while underway to allow for unlimited duration at sea with no requirement for oilers.

The CVT-1 design is smaller than current US Navy carriers and is intended to be less expensive. The student team developed mission concepts where several CVT-1 carriers would operate within the same strike group to provide redundancy to operations. Survivability was calculated as being good with adequate safety and damage control measures put in place to deal with potential hydrogen and methane leaks. Part of the students' presentation discussed some common misconceptions around the danger of hydrogen fuel and assuaged audience concerns.

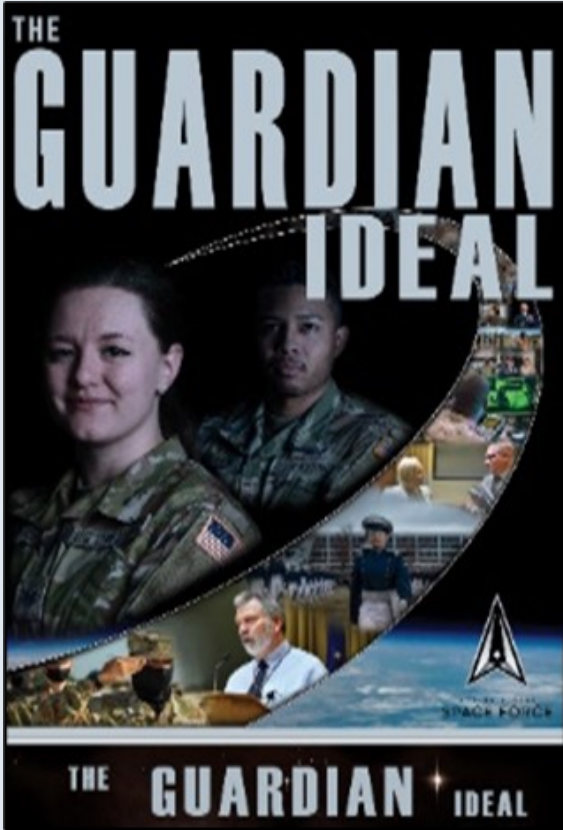
The team was advised by Dr. Fotis Papoulias (systems engineering) and Dr. Jake Didoszak (mechanical and aerospace engineering), and builds on a legacy of prior student and faculty research into hydrogen-powered aviation and drones. For more information, please contact either Dr. Papoulias: [papoulias@nps.edu](mailto:papoulias@nps.edu) or Dr. Didoszak: [jmdidosz@nps.edu](mailto:jmdidosz@nps.edu). The Total Ship Systems Engineering program at the Naval Postgraduate School helps to train the next generation of Engineering Duty Officers for the Navy, and often has student participants from the other Tri-Maritime Services.

The Total Ship Systems capstone team is all smiles after a successful brief with stakeholders. From left to right: Professor Jake Didoszak (TSSE Advisor), LCDR Benjamin Carver (Navy), LT Taylor Bowden (Navy), Capt Jared Valeske (Marines), LT Patrick Tapp (Navy) (Holding the 3D model), LT John Walter (Navy), LT Grace Albertson (Navy), LT Justin Goff (USCG), LT Molly Robertson (Navy), LT Lucas Tucker (Navy), Professor Fotis Papoulias (TSSE Co-Advisor)





## U.S. Space Force Team wins the Fall 2022 Master of Science in Systems Engineering Management (MSSEM) Capstone Competition



The U.S. Space Force team including LTC Jung W. Pak, Capt. Benjamin J. Waldon, CPT Jacob A. Zenger, CPT Aaron L. Johnson, and CPT Tina C. Hill was advised by Professor Corina White and Dr. Clifford Whitcomb won the Fall 2022 Capstone Competition.

The team's research assisted in providing recommendations for the Space Force Enterprise Talent Management Office by detailing the systems engineering approach and recommendations on how to apply and integrate a scalable competency-driven system effectively, assessing best practices for implementing scalable competency-driven systems by reviewing software platforms already integrated into the respective civilian and military organizations for talent management, and conducting qualitative and quantitative research to validate the recommendations through data analytics.

The efforts of this team are exemplary and highlight the impactful research efforts of NPS Systems Engineering students and how their level of dedication make significant contributions to the DoD/Navy/USSF.



# Awards and Graduations

## Awards

### Dr. Barry Boehm Award for Doctoral Student Research Excellence

Mr. Daniel J. Herrington, Office of the Secretary of Defense, Cost Assessment and Program Evaluation

### NAVSEA Award for Excellence in Systems Engineering

LCDR Christofer Fackrell, USN

### Chief of Naval Research Award for Excellence in Robotics and Autonomous Systems Research

LT Frank Chase Smeeks IV, USN

### Meyer Award for Outstanding DL Student in Systems Engineering

311-192N: Mr. Thomas Michael Buetow, Naval Surface Warfare Center, Crane Division

311-212O: Mr. Larry D Mannings, Naval Undersea Warfare Center, Division Newport

### Meyer Award in Systems Engineering for DL Teaching

311-192N: Douglas Lee Van Bossuyt

Rama D. Gehris

311-212O: Corina L. White

### Resident Systems Engineering Management Capstone Competition Winner

#### Cohort 522-214

**Capstone Title:** U.S. SPACE FORCE (USSF) ACQUISITION OCCUPATIONAL COMPETENCY INTEGRATION INTO A TALENT OPERATIONS PLATFORM

**Members:** Jung Pak, Benjamin Waldon, Jacob Zenger, Aaron Johnson, and Tina Hill

**Advisors:** Corina White and Clifford Whitcomb

### Outstanding Capstone

#### Cohort 311-192N Team Alliance

**Capstone Title:** HARDWARE-IN-THE-LOOP ARCHITECTURE IN A MODEL-BASED SYSTEMS ENGINEERING ENVIRONMENT

**Members:** Laura Best, Chelsea Harrison, Steven Holland, Eric Slack, and David Walsh III

**Advisors:** Corina White, and Douglas Van Bossuyt

#### Cohort 311-192N Team Champions of the Sun

**Capstone Title:** MOVEABLE, DEPLOYABLE MICROGRID ANALYSIS

**Members:** Jordan Drake, Graham Hardman, William Kimble, Andrea Rodriguez, and Bradley Smith

**Advisors:** Douglas Van Bossuyt, Anthony Pollman, and Corina White

### Outstanding Thesis

LCDR Christofer Fackrell, USN

LT Frank Chase Smeeks IV, USN



## Recommendation for Graduation with Distinction

LCDR Christofer Fackrell, USN

Mr. Thomas Michael Buetow, Naval Surface Warfare Center, Crane Division

Mr. J. David Ingalls, Naval Surface Warfare Center, Crane Division

Mr. Larry D Mannings, Naval Undersea Warfare Center, Division Newport

### Theses

**LT Steven Arnold, USN**

**Thesis Title:** VIRTUAL AND ARTIFICIAL REALITY (VR/AR) APPLICATIONS FOR UNITED STATES COAST GUARD

**Advisor:** Douglas Van Bossuyt and **Co-Advisor:** Amela Sadagic

**LCDR Christofer Fackrell, USN**

**Thesis Title:** EXPERIMENTAL ASSESSMENT OF A NOVEL DUAL OPENING DEWAR FOR USE ON A LIQUID AIR ENERGY STORAGE SYSTEM INSTALLED ON REMOTE, ISLANDED, RENEWABLE MILITARY MICROGRIDS

**Advisor:** Anthony Pollman and **Co-Advisors:** Anthony Gannon and Douglas Van Bossuyt

**LT Denntrick Akeem Horton, USN**

**Thesis Title:** VERIFICATION AND VALIDATION OF NAVAL AIR WARFARE CENTER AIR DIVISION (NAWCAD) F/A-18 TIME-MACHINE MODEL

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**LT Frank Chase Smeeks IV, USN**

**Thesis Title:** DEVELOPMENT OF OPERATIONAL SCENARIOS FOR HYDROGEN-POWERED UNMANNED AERIAL VEHICLES IN NAVAL APPLICATIONS

**Advisor:** Anthony Pollman and **Co-Advisors:** Anthony Gannon and Douglas Van Bossuyt

**LT Jasmine T. Sweet, USN**

**Thesis Title:** VERIFICATION AND VALIDATION OF PERFORMANCE METRIC MODELS DEVELOPED BY NAWCAD

**Advisor:** Douglas Van Bossuyt and **Co-Advisor:** Ronald Giachetti

### Capstone Teams

**308-204**

**Capstone Title:** MISSION ENGINEERING FOR HYBRID FORCE 2025

**Members:** Jeremy Brown, Nicholas Coker, Alyson Groff, Jin Meng Bryan Low, Jia Ming Neo, Lesleigh Rodrigo, Joshua Schultz, William Sunda III, and Nathan Walker

**Advisors:** Fotis Papoulias and Jefferson Huang

**Cohort 311-192N Team Alliance**

**Capstone Title:** HARDWARE-IN-THE-LOOP ARCHITECTURE IN A MODEL-BASED SYSTEMS ENGINEERING ENVIRONMENT

**Members:** Laura Best, Chelsea Harrison, Steven Holland, Eric Slack, and David Walsh III

**Advisors:** Corina White, and Douglas Van Bossuyt

### Cohort 311-192N Team Champions of the Sun

**Capstone Title:** MOVEABLE, DEPLOYABLE MICROGRID ANALYSIS

**Members:** Jordan Drake, Graham Hardman, William Kimble, Andrea Rodriguez, and Bradley Smith

**Advisors:** Douglas Van Bossuyt, Anthony Pollman, and Corina White

### Cohort 311-192N Team Tom

**Capstone Title:** MICROGRID RESILIENCE ANALYSIS SOFTWARE DEVELOPMENT

**Members:** Thomas Buetow, James Ingalls, Michael Ledden Jr, Andrew Palmer, and Ricardo Perez

**Advisors:** Douglas Van Bossuyt, Ronald Giachetti, Giovanni Oriti, Daniel Reich, Mark Rhoades, and Corina White

### Cohort 311-212O Team F.I.B.E.R

**Capstone Title:** ANALYSIS OF VEHICLE-MOUNTED HIGH ENERGY LASER(S) FOR EXPEDITIONARY OPERATIONS

**Members:** Terry Dang, Samantha Hazard, Aaron Huott, and Joshua McDonald

**Advisors:** Bonnie Johnson, Joseph Blau, and Rolf Johnson

### Cohort 311-212O Team UxS - DROSERA

**Capstone Title:** COUNTER-UXS ENERGY AND OPERATIONAL ANALYSIS

**Members:** Jason Behling, Fernando Fuentes, Larry Mannings, Golda Morgan, and Jonathan Schinowsky

**Advisors:** Douglas Van Bossuyt, Britta Hale, and Corina White

### Cohort 522-214 Team What the FIPP

**Capstone Title:** FLIGHT INFORMATION PRIORITY BY PHASE

**Members:** Stuart Brimmer, Sean Cochran, Jared Colvin, Andrew Durfee, Eric Page, and Terence Street Jr.

**Advisors:** Lawrence Shattuck, Matthew Nicholson, and Panagiotis Matsangas

### Cohort 522-214 Team Environmental Alliance

**Capstone Title:** ANALYSIS OF PATHWAYS TO REACH NET-ZERO NAVAL OPERATIONS BY 2050

**Members:** Eric Forsgren, John Hohng, Brian Jernigan, Joseph Lucas, Steven Moore, and Justin Strait

**Advisors:** Bonnie Johnson and Kristen Fletcher

### Cohort 522-214 Team Progression

**Capstone Title:** SYSTEMS ANALYSIS OF ARMY MATERIEL REPORTING FOR MIDDLE TIER OF ACQUISITION

**Members:** John Graham, Mikel Hernandez-Trujillo, Chad Howard, Jesse Meininger, and James Oliver

**Advisors:** Alejandro Hernandez and Candice Farney

### Cohort 522-214

**Capstone Title:** U.S. SPACE FORCE (USSF) ACQUISITION OCCUPATIONAL COMPETENCY INTEGRATION INTO A TALENT OPERATIONS PLATFORM

**Members:** Jung Pak, Benjamin Waldon, Jacob Zenger, Aaron Johnson, and Tina Hill

**Advisors:** Corina White and Clifford Whitcomb

### 711 Team MGM

**Capstone Title:** MICROGRID MODELING ASSESSMENT FOR CLIMATE TRENDS AND WEATHER EVENTS

**Members:** Jacob Bell, John Berry, Christian Bowers, and Charles Slagle

**Advisors:** Douglas Van Bossuyt and Ronald Giachetti



### Master of Science in Systems Engineering

LT Steven Arnold, USN  
LCDR Christofer Fackrell, USN  
LT Denntrick Akeem Horton, USN  
LT Lesleigh Garrick Rodrigo, USN  
LT Frank Chase Smeeks IV, USN  
LT Jasmine T. Sweet, USN  
Mr. Jason A Behling, Naval Surface Warfare Center, Crane Division  
Mr. Thomas Michael Buetow, Naval Surface Warfare Center, Crane Division  
Mr. Terry Dang, Naval Undersea Warfare Center, Division Newport  
Mr. Jordan M Drake, Naval Surface Warfare Center, Crane Division  
Eng. Fernand Fuentes, Naval Surface Warfare Center, Dahlgren Division  
Mr. Graham Douglas Hardman, Naval Surface Warfare Center, Crane Division  
Ms. Samantha Jane Hazard, Naval Undersea Warfare Center, Division Newport  
Mr. Steven T Holland, Naval Surface Warfare Center Crane Division  
Mr. Aaron M Huott, Naval Air Systems Command  
Mr. J. David Ingalls, Naval Surface Warfare Center, Crane Division  
Mr. William Charles Kimble, Naval Surface Warfare Center, Crane Division  
Mr. Michael J Ledden, Naval Surface Warfare Center, Crane Division  
Mr. Larry D Mannings, Naval Undersea Warfare Center, Division Newport  
Mr. Joshua Dufau McDonald, Naval Air Systems Command  
Ms. Golda Rose Morgan, Naval Surface Warfare Center, Corona Division  
Mr. Andrew R Palmer, Naval Research Laboratory  
Mr. Ricardo Perez, Naval Surface Warfare Center, Crane Division  
Ms. Andrea Rodriguez, Naval Surface Warfare Center, Crane Division  
Mr. Jonathan T Schinowsky, Naval Information Warfare Center Pacific  
Mr. Eric S. Slack, Naval Surface Warfare Center, Crane Division  
Mr. Brad I Smith, Naval Surface Warfare Center, Crane Division  
Mr. David T. Walsh III, Naval Surface Warfare Center, Crane Division

### Master of Science in Engineering System

CAPT Jeffrey A Brown, USN

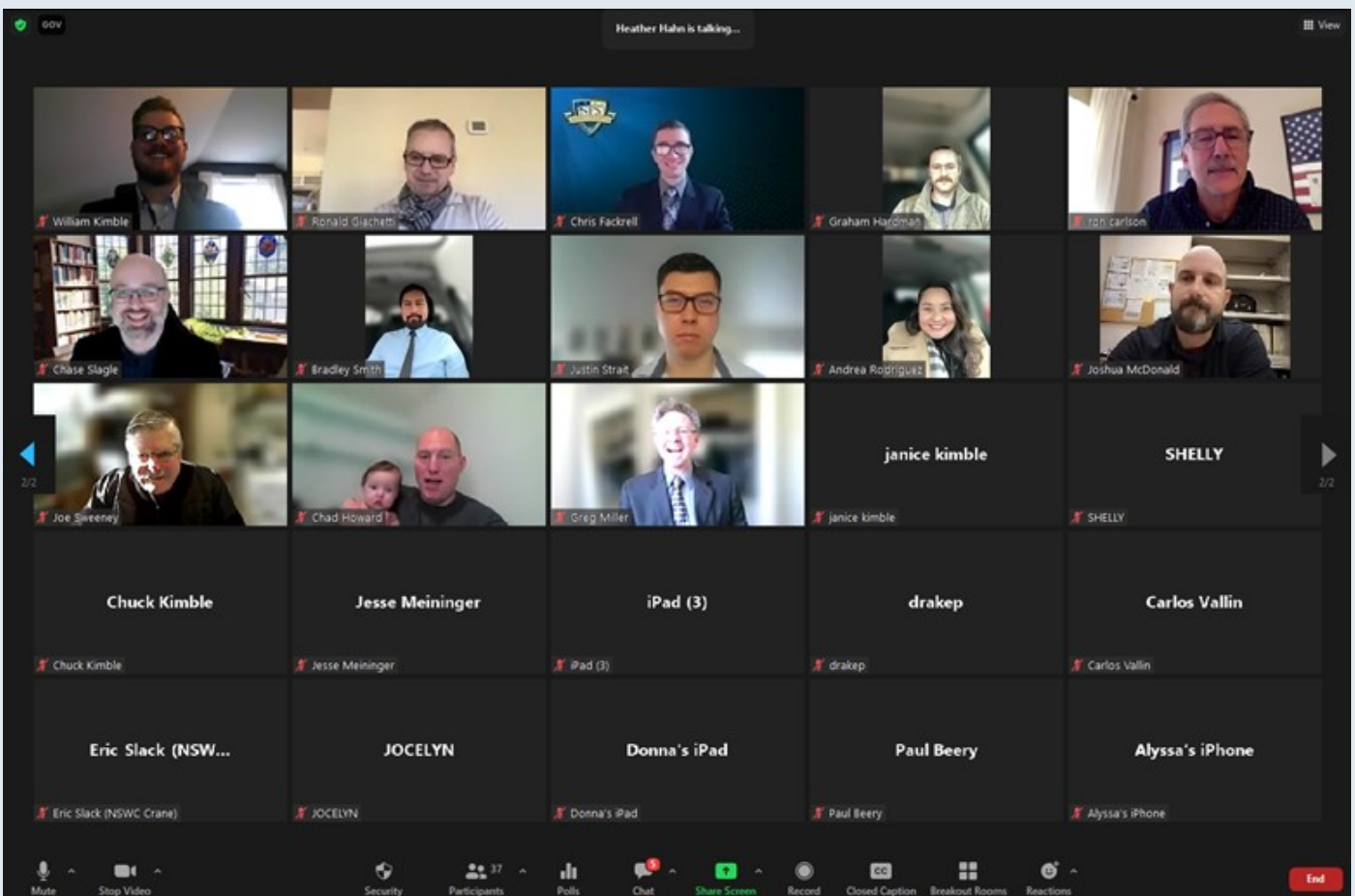
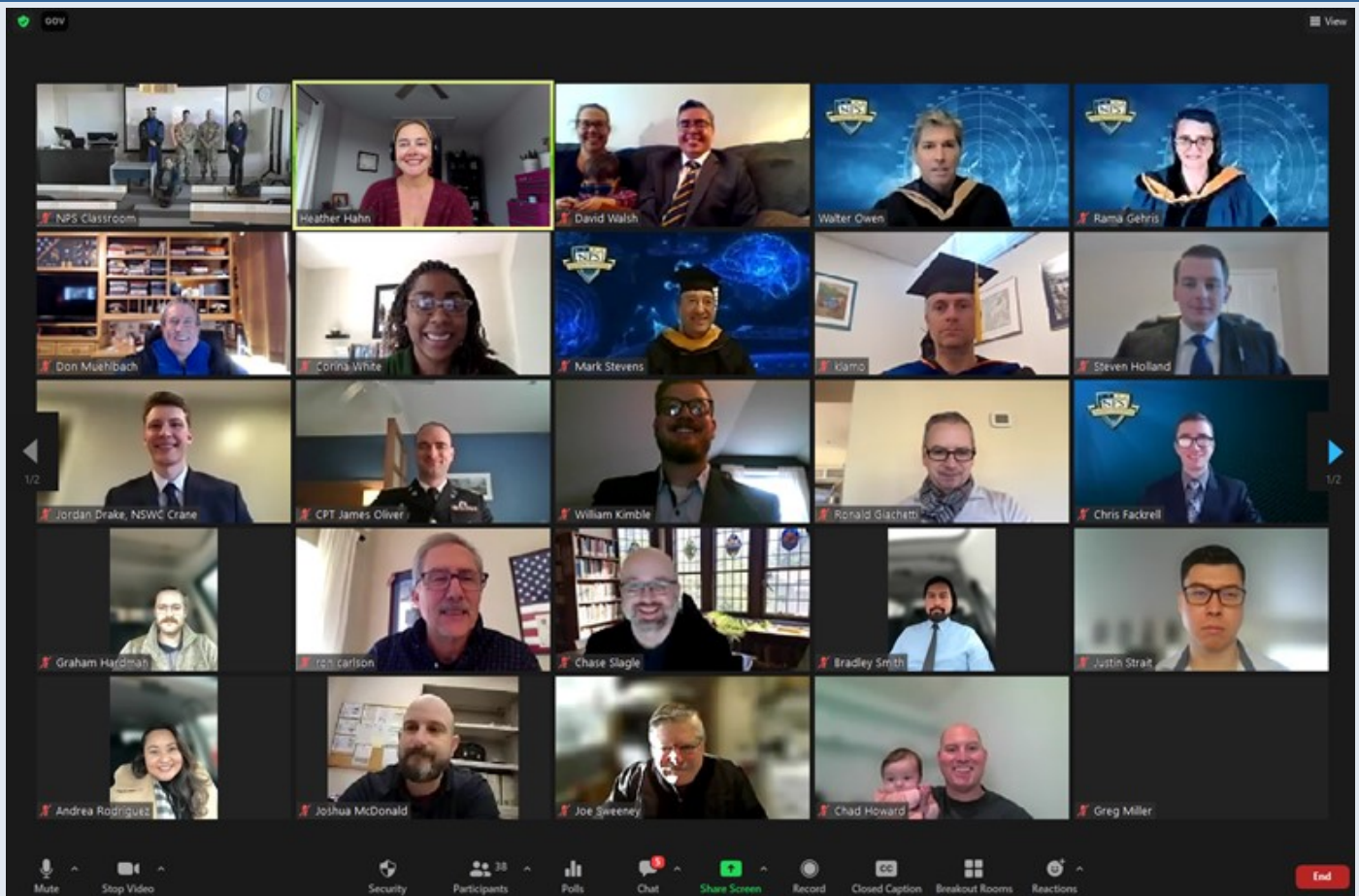
### Master of Science in Systems Engineering Management

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CPT Andrew Francisco Durfee, USA  
MAJ Eric Brandon Forsgren, USA  
MAJ John William Graham, USA  
CPT Mikel R. Hernandez, USA

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MAJ Steven Andrew Moore, USA  
CPT James K. Oliver, USA  
CPT Eric M. Page, USA  
LTC Jung Pak, USA  
CPT Justin M. Strait, USA  
CPT Terence D. Street, Jr., USA  
CPT Jacob A. Zenger, USA  
Capt Benjamin Jay Waldon, USSF  
Mr. Jacob Maurice Bell, Naval Air Warfare Center, China Lake  
Mr. John L Berry, Naval Information Warfare Center, Pacific  
Mr. Christian Farrell Bowers, Naval Facilities Engineering and Expeditionary Warfare Center  
Mr. Charles Doranda Slagle, Naval Surface Warfare Center, Port Hueneme Division



## Systems Engineering Distance Learning Graduation Photos



## Request for Alumni News!

The SE Department is interesting in hearing how our alumni are doing.  
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Dr. Oleg Yakimenko, Department Chair - [oayakime@nps.edu](mailto:oayakime@nps.edu)

Mark Stevens, Associate Chair for Instruction- [mstevens@nps.edu](mailto:mstevens@nps.edu)

Dr. Wally Owen, Associate Chair for Distributed Learning & Outreach - [wowen@nps.edu](mailto:wowen@nps.edu)

Dr. Warren Vaneman, Deputy Associate Chair for Marketing, Outreach and Engagement - [wvaneman@nps.edu](mailto:wvaneman@nps.edu)

Dr. Tony Pollman, Associate Chair for Operations - [agpollma@nps.edu](mailto:agpollma@nps.edu)

Mark Stevens, Academic Associate 308 Systems Engineering Analysis & 580 Systems Engineering - [mstevens@nps.edu](mailto:mstevens@nps.edu)

Dr. Andy Hernandez, Academic Associate 522 Systems Engineering Management - [ahernand@nps.edu](mailto:ahernand@nps.edu)

Dr. Ray Madachy, Academic Associate 311 Systems Engineering (DL) - [rjmadach@nps.edu](mailto:rjmadach@nps.edu)

Dr. Katy Giles, Academic Associate 312 Aviation Systems Engineering (DL) & 711 Systems Engineering Management (DL) - [kb Giles@nps.edu](mailto:kb Giles@nps.edu)

Dr. Kristin Giammarco, Academic Associate 721 Systems Engineering Management (DL) & Program Officer 581, 582 - [kmgiamma@nps.edu](mailto:kmgiamma@nps.edu)

Dr. Paul Beery, Academic Associate 722 Systems Engineering Management (DL) - [ptbeery@nps.edu](mailto:ptbeery@nps.edu)

Dr. Douglas Van Bossuyt, Academic Associate 581 Systems Engineering PhD & 582 Systems Engineering PhD (DL) - [douglas.vanbossuyt@nps.edu](mailto:douglas.vanbossuyt@nps.edu)

CDR Caleb MacDonald, Program Officer 380, 580, 522 - [caleb.macdonald@nps.edu](mailto:caleb.macdonald@nps.edu)

Joseph Sweeney, Program Officer 311, 312, 711, 721, 722 - [jwsweene@nps.edu](mailto:jwsweene@nps.edu)

Kathie Cain, Faculty Associate- Education - [kmcain@nps.edu](mailto:kmcain@nps.edu)

Heather Hahn, Ed Tech Systems Engineering (DL) - [hlhahn@nps.edu](mailto:hlhahn@nps.edu)

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