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Systems Engineering Distance Learning March 25, 2021 Graduation via Zoom

Letter from the Chairman

Welcome to the Systems Engineering Newsletter for the 2021 Winter Quarter. For the winter graduation in March, the Systems Engineering department had 38 graduates across our resident and distance learning programs.

We held a Zoom graduation celebration that was attended by almost a hundred people. We may have started these Zoom graduation celebrations due to Covid, but I see us continuing them because it allows many graduates, family, and friends to participate in the graduation who would not otherwise be able to.

As our guest speaker, we had Mr. Paul Mann, the Department of Navy Chief Systems Engineer (CHENG). He spoke about the legacy of Wayne E. Meier for whom many of the systems engineering awards are named after. He also discussed where he sees systems engineering going in the Navy. We were glad to have him as our speaker, and we see his willingness to speak to our graduates as a strong endorsement of the value of our programs to the Navy.

We like to think of ourselves as innovators, and one of the latest innovations we have introduced is a stackable certificates program. Many of our sponsors in the Navy, Marine Corps, Army, Missile Defense Agency, and other sponsors have been interested in one or more of our certificates. Meanwhile, the students enrolled in these certificates often want to know how they can leverage the certificate into a MS degree. The stackable certificate concept allows that. Students can combine multiple certificates and apply for either a MS in Systems Engineering or a MS in Systems Engineering Management degree program, depending on what certificates and background they have. Look out for more information on the stackable certificate program, or contact the department for more information.



Dr. Ronald Giachetti

There is now a large network of several thousand SE alumni throughout the DoD workforce. We are always interested in hearing what our alumni are doing, so please feel free to send us updates.

Sincerely,

Ronald Giachetti, Ph.D.
Professor of Systems Engineering
Systems Engineering Dept Chair, NPS

NPS Alumnus Selected for Artemis Team

Courtesy of scitechdaily.com

NASA astronaut Matthew Dominick is a member of the Artemis Team, a select group of astronauts charged with focusing on the development and training efforts for early Artemis missions.

Matthew Dominick was selected by NASA to join the 2017 Astronaut Candidate Class. He reported for duty in August 2017 and completed two years of training as an Astronaut Candidate.

The Colorado native earned a Bachelor of Science in Electrical Engineering from the University of San Diego and a **Master of Science degree in Systems Engineering** from the **Naval Postgraduate School**. He graduated from U.S. Naval Test Pilot School. He has more than 1,600 hours of flight time in 28 aircraft, 400 carrier-arrested landings, and 61 combat missions.

Through the Artemis program NASA and a coalition of international partners will return to the Moon to learn how to live on other worlds for the benefit of all. With Artemis missions NASA will send the first woman and the next man to the Moon in 2024 and about once per year thereafter.

Through the efforts of humans and robots, we will explore more of the Moon than ever before; to lead a journey of discovery that benefits our planet with life changing science, to use the Moon and its resources as a technology testbed to go even farther and to learn how to establish and sustain a human presence far beyond Earth. <https://scitechdaily.com/meet-nasa-astronaut-artemis-team-member-matthew-dominick-video/>



NASA Astronaut Matthew Dominick. Credit: NASA/Bill Stafford

NPS Alumnus Selected for NIWC-LANT Supervisory Position



Mr. Adam McCann

NPS Alumnus Adam McCann was recently selected as the 5.5 Communications and Networks, 55300 Shore Networks, 55350 C4I Networks Competency Supervisor at the Naval Information Warfare Center-Atlantic (NIWC-LANT). Mr. McCann has been working at NIWC LANT for the past 17 years.

Mr. McCann started working for NIWC after graduating from the College of Charleston with a Bachelor's Degree in Computer Science. His early career focused on

modeling and simulation of shore/shipboard networks and he is well versed in SysML. Since then he has provided network engineering and modeling support to the Coast Guard, Littoral Combat Ship (LCS), and Military Sealift Command (MSC) networks. Most recently he has supported the Naval Messaging IPT.

Mr. McCann graduated from the Naval Postgraduate School in 2019 with a Master of Science in Systems Engineering Management and "With Highest Distinction" honors. Mr. McCann also earned a Space Systems Certificate from NPS.

NAVFAC EXWC Publishes Article about NPS Graduate

NPS Systems Engineering Ph.D. graduate Mr. William W. Anderson Jr. was recently interviewed by The Naval Facilities Engineering and Expeditionary Warfare Center (NAVFAC EXWC) for its online magazine, "[EXWC Edge](#)."

William Anderson is the NAVFAC EXWC Director of Utilities Engineering and Management. He graduated from NPS in

December 2020 after earning his Ph.D. for his work developing a model to analyze the resilience and cost of microgrids on islanded Naval bases.

Dr. Anderson gave a lecture on his dissertation at the first offering of the [NAVFAC EXWC Microgrid Academy](#), co-hosted by NPS and the Office of Naval Research.

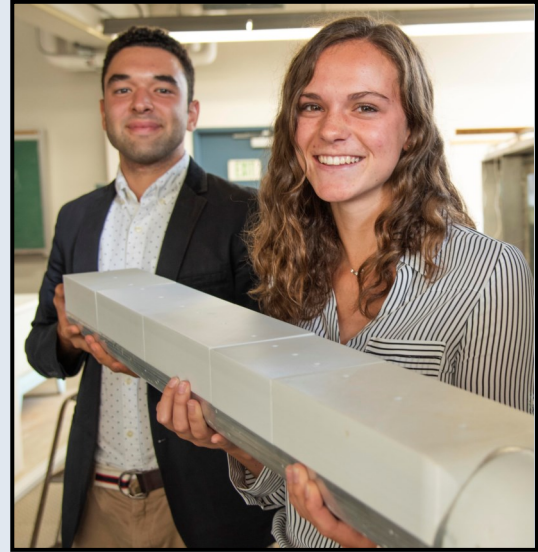
Ocean Engineering Journals Publish Former NPS Students' Research

By Assistant Professor Joseph Klamo

Two top-tier, peer-reviewed Ocean Engineering journals recently published the work of three former Naval Postgraduate School students: NPS graduate student LT Travis Turner, Science and Engineering Apprenticeship Program (SEAP) Intern Kathryn Yeager, and Naval Research Enterprise Internship Program (NREIP) Intern Colin Cool.

The cumulative research performed by the three students uncovered the role that cross-sectional shape plays on wave-induced loads and assessed the accuracy of the mathematical model they investigated.

Their discoveries were highlighted in articles titled "[The Effects of Cross-Sectional Geometry on Wave-Induced Loads for Underwater Vehicles](#)" published in IEEE Journal of Oceanic Engineering, and "[On the Accuracy of an Analytical Solution to Model Wave-Induced Loads on an Underwater Vehicle in Real-Time](#)" published in ASME Journal of Offshore Mechanics and Arctic Engineering.



Left to right: Colin Cool and Kathryn Yeager



LT Travis Turner

Systems Engineering alumnus LT Travis Turner focused his thesis on how the wave-induced loads on an unmanned underwater vehicle (UUV) depend on the cross-sectional shape of the vehicle.

He also assessed the accuracy of an existing analytical solution at predicting these loads. The goal was to find suitable mathematical models for these loads for use within a model-based systems engineering (MBSE) approach when designing future UUVs.

LT Travis Turner was advised by Assistant Professor Joseph Klamo and earned his Master of Science degree from Naval Postgraduate School in 2018.

High school senior Kathryn Yeager and college sophomore Colin Cool continued LT Turner's research in 2018 as interns at the Naval Postgraduate School.

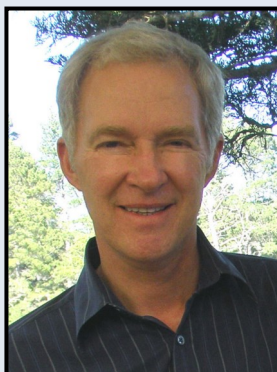
They looked at more cross-sectional shapes and how the slenderness of the vehicle affects the wave-induced loads. Both interns were mentored by Assistant Professor Joseph Klamo

As the U.S. Navy continues to utilize UUVs in increasing numbers, the former students' research findings will support the systems engineering design process used for the next-generation UUVs.

This research effort was made possible through support provided by the Consortium for Robotics and Unmanned Systems Education and Research (CRUSER) project sponsored by the Department of the Navy, Office of Naval Research.

Former Systems Engineering Lecturer Publishes in Army Magazine

By Chairman Ronald Giachetti



John Dillard, Col.
USA (Retired)

Recently retired Senior Lecturer John Dillard has written a short article titled "[Understanding Acquisition: The Colors of Money](#)" for the Army's AL&T (Acquisition, Logistics and Technology) Magazine. Army AL&T magazine is the Army Acquisition Executive's quarterly professional journal for the Army Acquisition Workforce.

"The colors of money" referenced in the article is a way of expressing and controlling what a budget authority may and may not be used for. The article discusses the various colors of money dealt with by programs in system acquisition: Research, Development, Test and Evaluation (RDT&E), Procurement, Military Construction, Operations and Maintenance/Sustainment (O&M) and Military Personnel.

Students in the Master of Science in Systems Engineering Management programs for the Army need a good understanding of the funding available and how it can be used.

Dr. Bonnie Johnson Speaks at C-UAS Acquisition Workshop

By Senior Lecturer Bonnie Johnson

Dr. Bonnie Johnson presented a talk at the March 2-4 2021 Acquisition Analytics for Counter UAS Workshop sponsored by MORS (Military Operations Research Society).

This workshop was held virtually to discuss the cost-effective fielding of counter UAS capabilities to protect UA assets against UAS threats.

Abstract: Advances in directed energy weapons technology are leading to fielded systems for the U.S. military and also for other countries' militaries in the near future. U.S. military forces need to be prepared to operate in future threat environments that include directed energy weapons.

The Naval Postgraduate School is conducting counter directed energy weapons research to characterize directed energy threat environments and develop solution concepts for protecting naval assets against this developing problem space.

The initial study focused specifically on high energy lasers as the adversarial threat and on naval unmanned aerial vehicles as a type of military asset that will be particularly vulnerable in this threat environment. The study identified solution concepts for defending unmanned aerial vehicles against adversarial high energy lasers and developed an analytical tool for determining lethality effects over a range of threat scenario parameters.



Senior Lecturer Bonnie Johnson

NAVAL POSTGRADUATE SCHOOL

Characterization of a DEW Threat Environment

<h3 style="margin: 0;">High Energy Lasers</h3> <p>Soft kills to computers, communications, navigation, control systems, electronics</p> <p>Dwell time, Line of sight, Targeting</p> <p>Interaction with atmospheric environment: turbulence, diffraction, refraction absorption, thermal blooming, etc.</p> <p>Hard kills to computers, communications, navigation, control systems, electronics</p> <p>Host Platforms: land-based, mobile, ship, aircraft</p>	<h3 style="margin: 0;">High Powered Microwaves & Radio Frequency</h3> <p>Shorter frequency than HEL</p> <p>Longer wavelength than HEL</p> <p>Inherently divergent beams</p> <p>Back-door attacks through gaps in metal shielding</p> <p>Vehicle stopping</p> <p>Out-of-band damage to circuits</p> <p>In-band damage to radars and communication systems</p> <p>Destructive thermal heat to electronics</p>
<h3 style="margin: 0;">Electromagnetic Pulses</h3> <p>Short pulse of energy – range of frequencies</p> <p>Militarized EMPs can result from nuclear explosions or non-nuclear means/ebombs</p> <p>EMP's damage electronics and create sparks that can cause explosions; large EMPs can damage aircraft, building, etc.</p>	
<h3 style="margin: 0;">Particle Beams</h3> <p>Future theoretical weapon</p> <p>Phasers, ion cannons, particle accelerator guns</p> <p>Nuclear collisions with atmosphere – energy loss</p> <p>High-energy beam of subatomic particles</p> <p>Nonlinear instabilities – collective beam effects</p> <p>Neutral particle beams for space</p> <p>Bremsstrahlung effects – electron energy loss</p> <p>Complex interaction for atmospheric propagation – beam expansion and contraction</p> <p>Propagation energy/intensity loss due to ionization and radiation</p>	<h3 style="margin: 0;">Millimeter Waves</h3> <p>Active Denial Systems</p> <p>Causes burning sensation in humans without causing damage</p> <p>Electrons accelerated, beam shaped by mirrors, antenna focuses beam on target</p> <p>Non-lethal Millimeter wave electromagnetic energy</p> <p>Designed for area denial, perimeter security, and crowd control</p>

Dr. Oleg A. Yakimenko Elected as an AIAA Fellow, Class of 2021

By Chairman Ronald Giachetti

Dr. Oleg Yakimenko has been elected an American Institute of Aeronautics and Astronautics (AIAA) fellow as part of the AIAA Class of 2021.

AIAA confers the distinction of Fellow upon individuals in recognition of their notable and valuable contributions to the arts, sciences or technology of aeronautics and astronautics. Nominees are AIAA Associate Fellows. Since the inception of this honor, 1,980 distinguished persons have been elected as a Fellow.

Yakimenko is Distinguished Professor and Associate Dean of Research at the Naval Postgraduate School, Monterey, California. He graduated from the Moscow Institute of Physics and Technology, received his Ph.D. in Aerospace Engineering from the Zhukovsky Air Force Engineering Academy, and D.Sc. in Operations Research from the Russian Academy of Sciences.

Throughout his 35-year career in aerospace engineering, Yakimenko has made distinctive internationally renowned

contributions in developing guidance, navigation, and control algorithms for satellites, manned and unmanned aircraft, guided weapons, and parachutes; modeling and simulation of combat systems; and human factors. He is an author and



Distinguished Professor Oleg Yakimenko

co-author of over 300 publications, including books and patents. He has graduated over 100 master's students and

10 Ph.D. students.

“The Class of 2021 AIAA Honorary Fellows and Fellows are among the best minds in our profession. I commend each member of this year’s Class on their career accomplishments and dedication to furthering our industry,” said Basil Hassan, AIAA president. “This distinguished set of individuals has earned the respect and gratitude of the aerospace community for their creativity and valued contributions to better understanding our universe and mentoring future generations of aerospace professionals.”

“AIAA takes great pride in honoring this Class of Honorary Fellows and Fellows. These professionals have distinguished themselves by their significant and lasting contributions to the aerospace community...” added Dan Dumbacher, AIAA Executive Director.

The American Institute of Aeronautics and Astronautics (AIAA) is the world’s largest aerospace technical society. For more information about AIAA, For visit www.aiaa.org

3 of 6 Papers Authored by SE Faculty Published in Special Issue INCOSE Journal

By Chairman Ronald Giachetti

The journal *Systems Engineering*, sponsored by the International Council on Systems Engineering (INCOSE), is the foremost journal for the systems engineering community.

The journal has published a special issue on Featured papers from 2019 (they were delayed due to COVID). The papers were selected by the Systems Engineering Editorial Board for the special issue.

Of the six papers selected, three of them were written by Systems Engineering (SE) faculty and students at the Naval Postgraduate School (NPS). Two of the papers were based on the dissertation research conducted by SE graduates, and all three are on topics of immediate relevance to the Navy and Department of Defense.

This is a great recognition of the high quality of the research and education performed by the Systems Engineering department.

The papers included are listed as follows:

[“Toward a Methodology for the System Integration of Adaptive](#)

[Resilience in Armor,”](#) introduces a novel augmentation to systems engineering methodology based on the integration of adaptive capacity, which produces enhanced resilience in technological systems that operate in complex operating environment. It is based on the dissertation research of LTC Joseph Cannon Ph.D. and his advisor, Eugene Paulo Ph.D.

[“A Method of Identifying and Analyzing Irrational System Behavior in a System of Systems”](#) proposes a new way to consider failure propagation between systems when a system is in the design phase. This may allow the Navy to identify potential failure scenarios much earlier which will save time and money, and ensure that high-quality systems with lower chance of failure during operation are fielded. This paper was written by Douglas L. Van Bossuyt, Ph.D., Bryan M. O’Halloran Ph.D., and Ryan M. Arlitt Ph.D.

[“A Mission-Based Architecture for Swarm Unmanned Systems,”](#) applies a mission engineering approach with model-based systems engineering foundations to formalize a swarm unmanned system design methodology and architecture. It is based on dissertation research performed by Kathleen Giles Ph.D. and Kristin Giammarco, Ph.D.

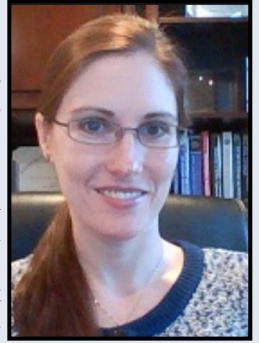
About the Authors:

Dr. Eugene Paulo is an Associate Professor in the Department of Systems Engineering at NPS. He developed and now teaches courses in model-based systems engineering and an introductory course in modeling and simulation in DoD. His research interests include development of a methodology using model-based systems engineering to allow for improved decision making, simulation analysis, and system architecting of complex military systems. Recently, he has focused on a range of maritime operational areas, to include mine warfare, distributed lethality, USMC expeditionary warfare, and autonomous systems.



Dr. Eugene Paulo

Dr. Kristin Giammarco is an Associate Professor in the Department of Systems Engineering at NPS, where she teaches courses in system architecture and design, system integration, systems software engineering, and model-based systems engineering, and conducts research in the use and development of formal methods for systems architecture modeling. Dr. Giammarco serves as the Joint Executive Systems Engineering Management (SEM-PD21) Program Academic Associate.



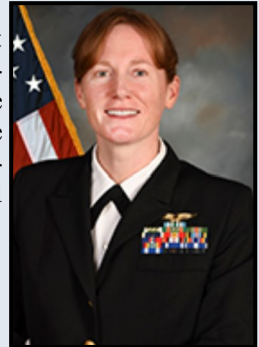
Dr. Kristin Giammarco

Dr. Douglas Van Bossuyt is an Assistant Professor in the SE Department at the NPS. His research focuses on understanding and mitigating deleterious emergent system behaviors from a risk analysis and failure modeling perspective through the development of system design methodologies targeted at the system architecture phase of the system design process.



Dr. Douglas Van Bossuyt

CDR Kathleen Giles is a Permanent Military Assistant Professor in the Department of Systems Engineering at the Naval Postgraduate School, where she teaches courses in systems test and evaluation and government acquisition, and conducts research in UAV swarms.



CDR Kathleen Giles

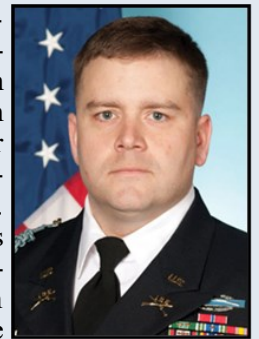
Dr. Bryan O'Halloran is an Assistant Professor in the SE Department at NPS and the Academic Associate for the Reliability and Maintainability certificate program (curriculum 242).

Previously, he was a Senior Reliability and Systems Safety Engineer at Raytheon Missile Systems (RMS) and the Lead Reliability and Safety Engineer for hypersonic missile programs.



Dr. Bryan O'Halloran

LTC Joseph Cannon is the deputy product manager for vehicle protection systems with TARDEC's Ground System Survivability Directorate. LTC Cannon also serves as the Battalion Commander of the 3 Battalion, 126th Infantry Regiment, 32 Infantry Brigade Combat Team. LTC Cannon has served two combat tours in support of Operation Enduring Freedom. Freedom. LTC Cannon has been awarded several medals, including the Bronze Star Medal and Army Commendation Medal with three Bronze Oak Leaf Clusters. He has also received several patents for his work on resilient armor.



LTC Joseph Cannon

Dr. Ryan M. Arlitt is an Assistant Professor in the Department of Mechanical Engineering at the Technical University of Denmark. His research focus is on understanding (1) how successful designers solve complex conceptual design challenges, and (2) how computational support can improve the likelihood and quality of success in conceptual design and beyond.



Dr. Ryan M. Arlitt

ARSENL's Heterogenous, Autonomous, Multi-Domain Swarming Vehicles

By Mariana Jones and CDR Katy Giles, USN

The Advanced Robotic Systems Engineering Laboratory (ARSENL) team, composed of team members Marianna Jones, CDR Katy Giles, USN, Dr. Kevin Jones and Dr. Duane Davis, has recently expanded their live-fly experimentation to heterogenous autonomous swarms in multiple domains.

In addition to the original Zephyr II fixed-wing aircraft, the payload-drop capable Mosquito Hawk quadcopter was home-grown in the lab.

ARSENL's swarm was augmented with another fixed-wing aircraft, the Penguin, which also has payload dropping capabilities.

The swarm's newest platform, the RC4WD Bully II "Rover" ground vehicle, was provided by SE's Lab Manager Albert Jordan.

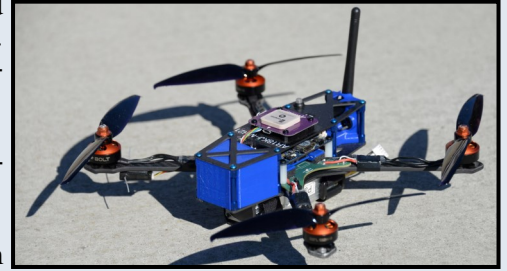
The *Swarm Brick* is a modular, compact electronics stack that is designed to integrate with several Pixhawk family autopilots and can be integrated into all of ARSENL's air and ground-based platforms.

As it turns out, the mode of travel is irrelevant to the major electronics utilized in the stack.

Peripheral sensors (airspeed, GPS, compass, etc.), can be added as needed and the platform-specific ArduPilot firmware loaded onto the autopilot.

Table 1 shows each vehicle's specifications

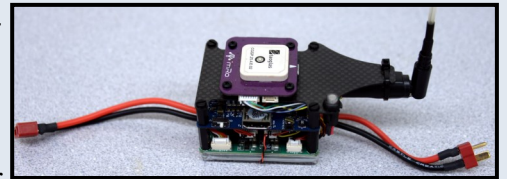
Stay tuned to next month's newsletter to learn about ARSENL's MASC Behavior Framework.



MoHawk



Rover



Swarm Brick

TABLE I: ARSENL Platform Configuration

	Zephyr II (blended wing)	Mosquito Hawk (quadcopter)	Penguin (fixed wing)	Bully II (ground vehicle)
Dimensions	1.45m (wingspan)	0.29m (motor axis to motor axis)	1.73m (wingspan)	0.44mx0.25m
Maximum Endurance	50min	20min	45min	Indefinite
Cruise Speed	18m/s	15m/s	12m/s	3m/s
Weight	2.5kg	0.64kg	1.8kg	2.375kg
Autopilot Computer	Pixhawk	PixRacer 1.5	PixRacer 1.5	PixRacer 1.5
Autopilot Software	ArduPlane 3.8	ArduCopter 3.5	ArduPlane 3.8	APMRover2 3.2
Autonomy Companion Computer	Odroid U3	Odroid C0	Odroid C0	Odroid C0

Dr. Warren Vaneman Represents NPS at First Annual MBSECON

By Dr. Warren Vaneman



Dr. Warren Vaneman
instructor and chair of the
program at NPS.

The first annual [MBSE-CON](#) (Model-Based Systems Engineering Conference) was held virtually from February 22-24, 2021 with the intent of beginning an open discussion about Model-Based Systems Engineering .

The conference was presented by Lifecycle Modeling Language and chaired by Dr. Warren Vaneman, Deputy Associate Chair of the Systems Engineering Department's Distance Learning

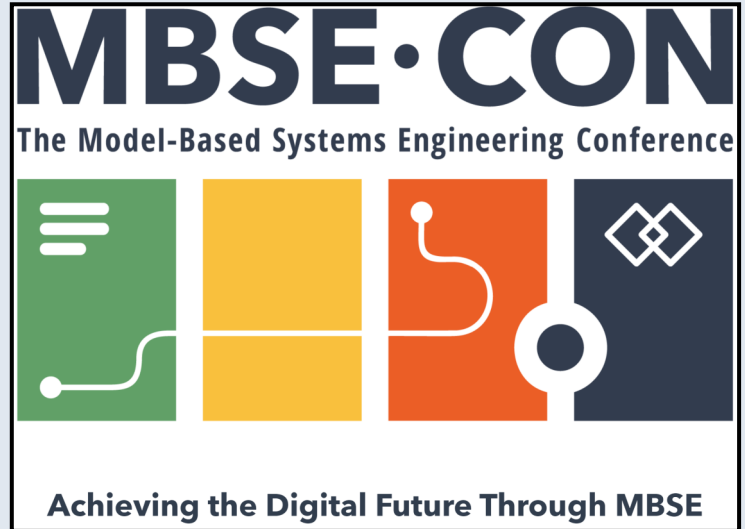
Program, and through the collection of modeling languages, structures, model-based processes, and presentation frameworks used to support the discipline of systems engineering in a model-based or model-driven context. Some MBSE implementation considerations were also discussed.

In addition to Dr. Vaneman's participation, LCDR Paul Evan, from the Strategic Systems Program, and a 2018 graduate of the Systems Engineering Non-Resident Master's Degree Program (curriculum 311), served as the Chair of the Ontology Panel.

The purpose of MBSE-CON was to bring together professionals interested in expanding systems engineering to a data-driven model-based solution, as well as academics that would like to stay up to date in the current usage of MBSE and/or would like to use it in the classroom. The conference attracted more than 100 attendees.

In addition to serving as the conference chair, Dr. Vaneman also chaired a panel titled "Future of MBSE" and hosted a tutorial titled "Demystifying Systems Engineering."

The tutorial was presented with the intent of moving the MSBE sub-discipline forward and defined MBSE as the formalized application of modeling (static and dynamic) to support system design and analysis, throughout all phases of the system lifecycle,



Capstone Corner

Students begin Capstone Projects

By Associate Professor Andy Hernandez

The 522-204 cohort (Master of Science in Systems Engineering Management) has initiated exploration of their capstone projects this spring. With 44 students in the cohort, the program began nine projects from a variety of stakeholder and sponsors. Stakeholders include the Navy Shore Energy Technology Transition and Integration (NSETTI) program, which will benefit from a generator replacement cost analysis for Rota, Spain.

To earn a human systems integration (HSI) certificate, fourteen 522 students have opted to enroll in the HSI sequence in which the final course is replaced with an HSI-related capstone project. In partnership with the Systems Engineering Department, the HSI Chair under the Operations Research Department developed three HSI projects for the 522 students. The projects will support a larger research effort for the Naval Aviation community.

The Training and Doctrine Command and Army Futures Command are supporting several projects that will feed the Army Campaign Plan and the Army 2028 Waypoint objectives. These nine projects include topics from contracting processes to cost analysis to human-system interfaces.

Another Cohort, 522-202, will complete their projects this spring. There are three teams that are addressing problems for the Army Research Laboratory, Army Engineer Research and Development Center, and Army Futures Command. The teams will graduate this spring. As a lead-in to graduation, the teams will participate in the Systems Engineering Management Capstone Competition mid-May. An announcement with more details will be published early May.

Student Stories

PhD Student Published in Systems Engineering Journal

By Assistant Professor Douglas Van Bossuyt and Mr. Jason Bickford

An article co-written by NPS Systems Engineering PhD student Mr. Jason Bickford and NPS Systems Engineering Assistant Professors Dr. Douglas Van Bossuyt, Dr. Paul Beery, and Dr. Anthony Pollman has been published in The Journal of the International Council on Systems Engineering (INCOSE), *Systems Engineering*.

The article, titled “[Operationalizing Digital Twins Through Model-Based Systems Engineering Methods](#),” has been captured as a Port Hueneme Research highlight for the NISE 219 program, and artifact logged in the Chief Technology Officer’s files for future Digital Twin researcher review.

It has already been distributed across multiple NAVSEA teams to communicate a methodology for scoping, architecting, and developing digital twins.

Several program offices have received

distribution of the article to capture and communicate the interest and value in operational digital twins.

Both Warfare Centers and Program Office teams have received the article to describe the vision for integrated digital engineering and digital thread.



Jason Bickford

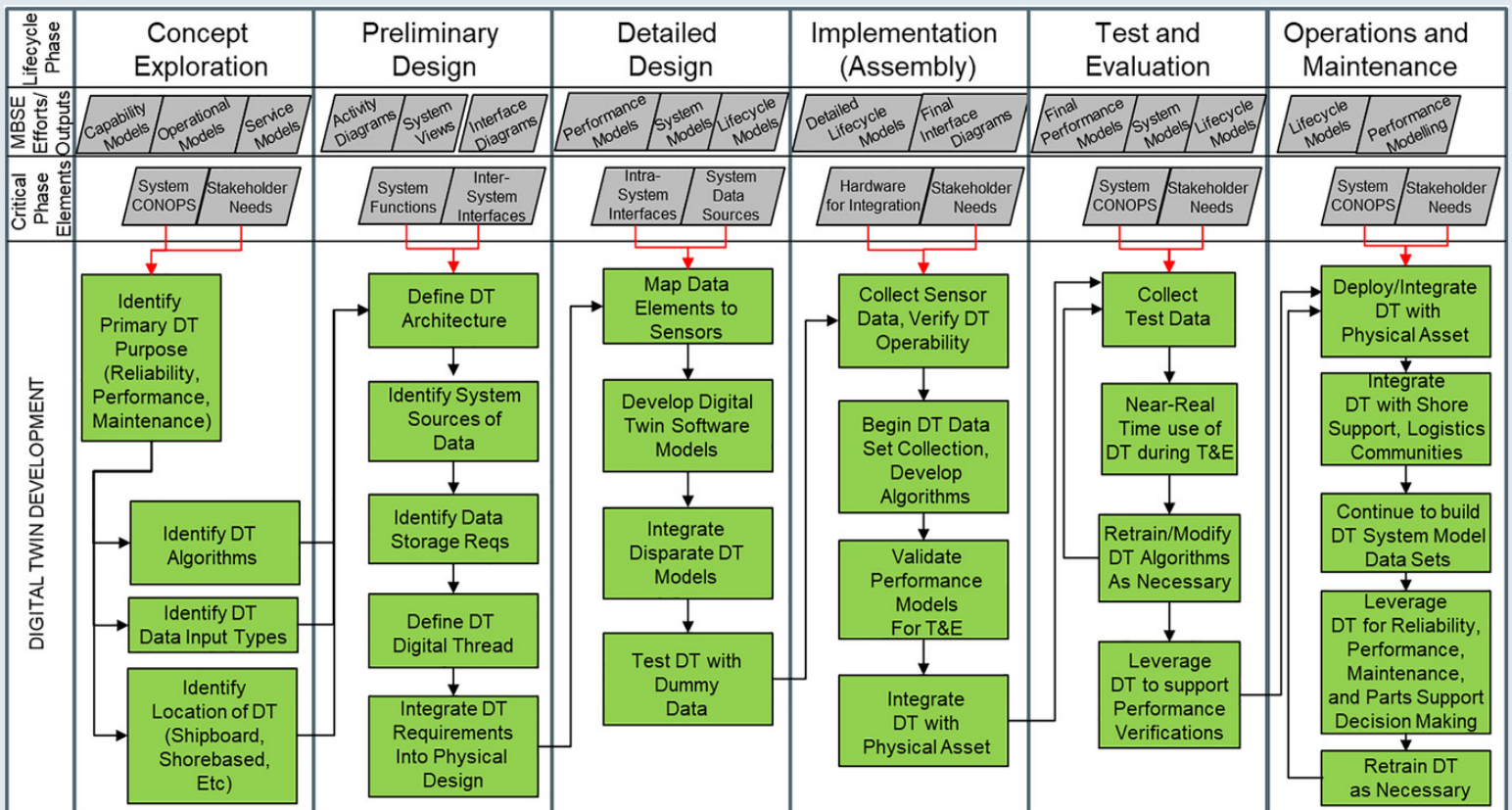
Jason Bickford was the lead author of the article. Mr. Jason Bickford is the

Research Manager at the Naval Surface Warfare Center (NSWC) in Port Hueneme, and is a current Doctoral student in the Systems Engineering Department at the Naval Postgraduate School.

Jason's professional experience includes sustainment engineering, test and evaluation, and acquisition systems engineering for a variety of Naval systems including combat systems and Directed Energy weapons.

Jason's research areas of interest include digital twins, prognostics and performance algorithms, and risk based assessments, with an emphasis on tools that improve warfighter and shore support decision making.

Jason holds a BS in Electrical Engineering from UC Davis, and a MS in Systems Engineering from the Naval Postgraduate School.



Digital twin development through MBSE process

Distance Learning Students Receive Meyer Award

Ms. Alexandra (Lexi) Kilmon and Commander Brian Fredrick were each selected for the Meyer Award for the 2021 Winter quarter.

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 distance learning systems engineering degree program.

Recipients are nominated by fellow classmates and the NPS Systems Engineering faculty. It is a very competitive process and a significant honor.



Ms. Lexi Kilmon

Ms. Kilmon led the Capstone project that resulted in a solution that will transition traditional cost estimation techniques into a model-based environment, providing potential benefits such as automated trade studies, optimization algorithms, and visibility into a holistic technical and programmatic perspective.

Her project ultimately resulted in tighter integration between cost data, the system design, and engineering data enabling the AURA program office to make better technical and programmatic decisions. The solution provided AURA the opportunity to review the evolution of the system's design and its impact to the cost of the program. Furthermore, the solution increased efficiency regarding engineering and acquisition practices given the automatic generation of required documents.

Lexi was raised in a small town outside of Gettysburg, PA. She graduated from the University of Pittsburgh in 2017 with a bachelor's degree in Industrial Engineering. She started working at NAVAIR in March of 2018 in the Cost and Schedule Analysis Department as an Integrated Government Scheduler for the H-60 program office. Then she rotated to HQ's Digital Group in support of the command's data science and MBSE/

SET initiatives. Given her extraordinary performance, she won the annual 2019 Excellence Award within the Cost Department.

After her first exposure to MBSE she volunteered to lead the effort of integrating cost estimation into the MBSE environment.

On her next rotation, she requested to be placed within the H-1 program office so that she could get involved with AURA's efforts, given they were leveraging MBSE for the development of the new platform.



CDR Brian Fredrick

Commander Brian Fredrick was selected for the Meyer award as a result of a combination of both instructor and peer feedback as well as overall academic performance.

CDR Fredrick graduated from Carnegie Mellon University in 2002 with a Bachelor of Science in Cognitive Science and a minor in Computer Science. He commissioned via Officer Candidate School at NAS Pensacola, FL in 2004, and earned his Naval Flight Officer wings in June of 2005.

In 2011 Commander Fredrick was selected to transition to Aerospace Engineering Duty Officer, and in the summer of 2012 was initially assigned to Naval Postgraduate School in Monterey, CA. He completed his Master of Science degree in Space Systems Operations in 2014.

He was selected and attended the U.S. Naval Test Pilot School at NAS Patuxent River, MD, and graduated with class 153 in June of 2018. CDR Frederick served in numerous fleet P-3C squadrons, completed 72 operational Navy RQ-4A Global Hawk missions in support of Operations NEW DAWN and ENDURING FREEDOM, and served in numerous Program Offices and Squadrons at NAVAIR.

Awards and Graduations

Awards

Meyer Award for Outstanding DL Student in Systems

Alexandra Kilmon
CDR Brian Christopher Fredrick, USN

Meyer Award in Systems Engineering for DL Teaching

Assistant Professor Douglas L. Van Bossuyt
Lecturer Timothy P. Anderson

Outstanding Thesis

CPT Seungwan Cho, Republic of Korea Army

Outstanding Capstone Report

311-193A Team MSET

Title:
INTEGRATING POWER-FLOW, RESILIENCE, AND COST MODELS FOR NAVAL INSTALLATION MICROGRIDS

Members: Curtis Bolen, Victoria Chu, Andy Dang, Paul Kim, Christian Proctor, and Bridget Shideler

Advisors: Douglas Van Bossuyt and Giovanna Oriti

Recommendation for Graduation with Distinction

CPT Seungwan Cho, Republic of Korea Army
LT Curtis D. Bolen, USN
LCDR Brian Christopher Thorpe, USN
MAJ Andrew Carl Poler, USA
Bridget Rose Shideler

Graduations

Master of Science in Systems Engineering

Maj Joseph John Davin, USMC
Maj Joseph Samuel Madren, USMC
Maj Richard John Jacobs, USMC
Maj Danie Neil Saaiman, USMC
LT Curtis D. Bolen, USN
LT Anup Fanish Engineer, USN
CDR Brian Christopher Fredrick, USN
LT Marcella HersterDudley, USN
LT Matthew Scott Hutson, USN

Master of Science in Systems Engineering, cont.

LCDR Ryan William Miller, USN
LCDR Eric Lynn Myers, USN
LCDR James William Stranges, USN
LCDR Brian Christopher Thorpe, USN
MAJ Patrick Casey O'Donnell, USA
MAJ Wesley Wade Paulsen, USA
MAJ Andrew Carl Poler, USA
MAJ Gregory Thomas Sievers, USA
Mr. Daniel Bethancourt, Department of Defense
Mrs. Melissa Rose Byron, Naval Air Warfare Center, Aircraft Division
Mr. John Edward Carlson V, Naval Air Systems Command
Ms. Victoria Chien Yi Chu, Naval Air Warfare Command, Weapons Division
Mr. Andy Quan Dang, Naval Air Systems Command
Mr. Owen Finch, Naval Air Warfare Center, Weapons Division
Mr. William Charles Garrity Jr., Naval Air Warfare Center, Aircraft Division
Ms. Alexandra L Kilmon, Naval Air Systems Command
Mr. Paul T. Kim, Naval Air Warfare Center, Weapons Division
Ms. Mariana Magaña, Naval Air Systems Command
Mr. Shawn Michael Nibert, Fleet Readiness Center Southeast
Mr. Tony Pacheco, Naval Air Systems Command
Mr. Matthew Ryan Phares, Naval Air Warfare Center, Aircraft Division
Mr. Christian Najee Proctor, Naval Air Warfare Center, Weapons Division
Ms. Julia Elizabeth Roscher, Naval Air Warfare Center, Training Systems Division
Mrs. Bridget Rose Shideler, Naval Air Warfare Center, Aircraft Division
Mr Wesley Tyler Wathen, Naval Air Warfare Center, Aircraft Division
Mr. Daniel J Wirth, Naval Air Systems Command

Master of Science in Engineering Systems

CPT Seungwan Cho, Republic of Korea Army
LT Scott Nicholas Nieman, USN
CW4 David John Fish, USA
Mr. William Paul Blickley, Naval Air Warfare Center, Aircraft Division, Webster Outlying Field

Master of Science in Systems Engineering Management

LT Daniel Thomas Beaton, USN
Mr. Gerald Matthew Smith, Naval Sea Systems Command

Individual Theses

LT Marcella HersterDudley, USN

Thesis Title: BUILDING RESILIENCE WITHIN DOD MICROGRIDS BY UNDERSTANDING HUMAN COGNITION IN RECOVERY PROCEDURES

Advisor: Douglas Van Bossuyt, **Co-Advisor:** Daniel Eisenberg

Individual Theses, cont.

CPT Seungwan Cho, Republic of Korea Army

Thesis Title: AI-BASED UXO DETECTION USING SUAS EQUIPPED WITH A SINGLE- OR MULTI-SPECTRUM EO SENSOR

Advisor: Oleg Yakimenko, **Second Reader:** Fotis Papoulias

LT Daniel Thomas Beaton, USN

Thesis Title: TESTING WHETHER DISTRIBUTED ENERGY STORAGE RESULTS IN GREATER RESILIENCE OF MICROGRIDS

Advisor: Douglas Van Bossuyt, **Second Reader:** Ronald Giachetti

Gerald Matthew Smith

Thesis Title: IDENTIFYING THE KEY MISCONCEPTIONS IN SYSTEMS ENGINEERING

Advisor: Robert Semmens, **Second Reader:** Anthony Pollman

Capstone Teams

Team Name: 311-193A Team COGLAX

Capstone Title: COGNITIVE LASER WEAPON SYSTEM – EXPLORING AUTOMATION, ARTIFICIAL INTELLIGENCE, AND HUMAN-MACHINE TEAMING FOR ENGAGEMENT

Members: William Blickley, John Carlson, Mariana Magaña, Antonio Pacheco, and Julia Roscher

Advisor: Bonnie Johnson

Team Name: 311-193A Team MSET

Title: INTEGRATING POWER-FLOW, RESILIENCE, AND COST MODELS FOR NAVAL INSTALLATION MICROGRIDS

Members: Curtis Bolen, Victoria Chu, Andy Dang, Paul Kim, Christian Proctor, and Bridget Shideler

Advisors: Douglas Van Bossuyt and Giovanna Oriti

Team Name: 311-193A Team FFG(X)

Title: A SYSTEMS ENGINEERING ANALYSIS OF THE PESTONI PILLARS AS THEY APPLY TO USN SURFACE WARSHIPS

Members: Daniel Bethancourt, Thomas Hatch, Shawn Nibert, and Daniel Wirth

Advisors: Bryan O'Halloran and Paul Beery

Team Name: 311-193A Team Radiance

Capstone Title: ENABLING COST ESTIMATING IN CAMEO SYSTEMS MODELER

Members: Melissa Byron, William Garrity, Alexandra Kilmon, Eric Myers, Matthew Phares, and Wesley Wathen

Advisor: Ronald Carlson

To see the full 2021 Winter Graduation Program for Systems Engineering, click [here](#).

Request for Alumni News!

The SE Department is interesting in hearing how our alumni are doing.
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