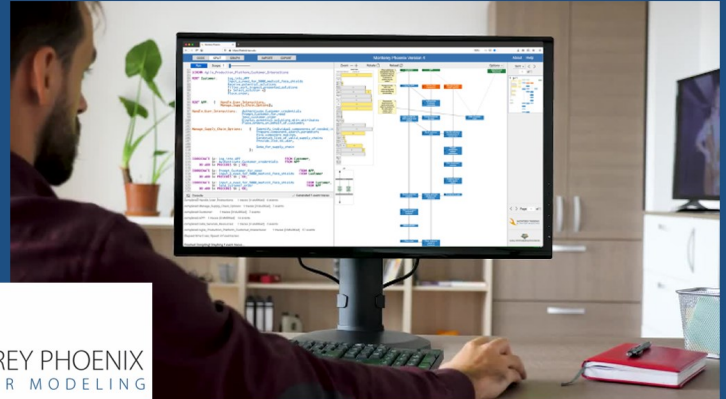


In This Issue:

- SE Spotlight
- Faculty News
- Spring Quarter Awards and Graduations

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<https://nps.edu/mp>

Letter from the Chairman

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

This quarter, the SE Department graduated eleven students - nine with a Master of Science in Systems Engineering degree and two with a Master of Science in Systems Engineering Analysis degree. ENS Ryan Plickys' thesis was recognized as outstanding thesis.

On June 21st, the Spring quarter's 335 graduates (158 U.S. Navy; 81 U.S. Marine Corps; 28 U.S. Army; 13 U.S. Air Force; 3 U.S. Coast Guard; 24 U.S. DOD Civilian; 24 Distance Learning; 1 Army Reserve National Guard; and 27 international graduates representing 19 countries), their families, faculty, staff, and guests attended the Winter Quarter Graduation Ceremony in King Hall. The commencement address was given by the Commander of Naval Information Forces (NAVIFOR) Vice Adm. Kelly Aeschbach.

In the Spring quarter, SE faculty taught 27 resident and distance learning sections and kept advising four capstone project teams. They also continued guiding research of SE's Ph.D. students, serving on a variety of departmental and schoolwide committees; participating in scientific conferences, and working on FY24 reimbursable research projects.

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



Systems Engineering Chairman
Dr. Oleg Yakimenko

Systems Engineering Students and Faculty Participate in the 23rd Annual Industry Trip

by
Dr. Warren Vaneman, ESEP Captain, U.S. Navy (Retired)

The Naval Postgraduate School's (NPS) Systems Engineering Distance Learning Program, led by Dr. Wally Owen, hosted the 23rd Annual Joint Executive Systems Engineering Management (PD21) Industry Trip, 8 -15 June 2024, to Central Florida. The primary focus for the 22 students and six faculty in attendance was to explore state of the art concepts, tools, and best practices in both management and technical domains of six high-performance organizations, including two for-profit companies, three governmental organizations, and one academic institution.

The for-profit organizations included the Northrup Grumman E-2D Hawkeye Program and a behind the scenes tour of the Cabana Bay Beach Resort.

The students and faculty traveled to the Northrup Grumman Facility in Saint Augustine and were provided with an overview of the E-2D Hawkeye Program and a tour of the factory where the aircraft are built. Unlike other military aircraft where different organizations develop sub-systems, the E-2D is engineered and built within Northrup-Grumman. This visit was significant because it provided the students (all of whom are Department of the Navy (DoN) employees) with an industrial perspective, thereby demonstrating the benefits of the government-industry partnership.

The resort staff of the Cabana Bay Beach Resort provided an overview of resort operations. While it may seem odd that DoN employees could benefit from learning about resort operations, many of the challenges of the resort are applicable to DoN operations. For example, for a resort may stay ahead of their competition to maintain market share in the resort marketplace. The DoN must stay ahead of their competition for the security of the United States.

The three governmental visits were the Naval Air Warfare Center Training Systems Division (NAWCTSD), the Curtis H. Stanton Energy Center, and NASA's Kennedy Space Center.

The Naval Air Warfare Center Training Systems Division (a subordinate of the Naval Air Systems Command (NAVAIR)) is the Navy's principal center for modeling, simulation and training systems technologies. NAWCTSD provides training systems development for a wide spectrum of military programs, including aircraft, surface ships, submarines and other specialized requirements. This visit provided insights into live, virtual, and constructive (LVC) simulation; a topic not otherwise covered in courses within the PD21 curriculum.



Industry Trip Group Experiencing a Simulation in the NAWCTSD Dome Room.

The Curtis H. Stanton Energy Center is a municipally owned public utility that provides electric service to the citizens of Orlando, and portions and portions of Central Florida. The Stanton Energy Center is the most diverse generating site in the state - natural gas, coal and solar are on the 3,280-acre property which can generate more than 1,800 megawatts of electricity. The visit highlighted the efficient use of resources to generate electricity through continuous process improvement using innovative approaches.



NPS Students and Faculty at the Stanton Energy Center.

The highlight of the Industry Trip was a full-day VIP tour of the NASA Kennedy Space Center. The tour was sponsored by NPS PD21 Alumnus, and NASA Astronaut, CAPT Victor “IKE” Glover, who was on-site and spent most of the day with the students and faculty. The Industry Trip group was given a tour of the Vehicle Assembly Building and the “Crawler” which transported the Apollo rockets, and Space Shuttle, and will take the Artemis space vehicles to the launch pad. The group was also treated to a tour of the Launch Control Center, guided by Charlie Blackwell-Thompson (Artemis Launch Director, and first female NASA Launch Director). The visit also included a tour of the Launch Pad 39B (where most NASA manned missions are launched from), the Space Shuttle Landing Facility, and the Saturn V Center.



Two National Treasures: CAPT Victor “IKE” Glover (NASA Astronaut) and Dr. Wally “Walleye” Owen (Associate Chair for Distance Learning in the Systems Engineering Department).



NPS Students and Faculty with Victor Glover and Charlie Blackwell-Thompson

The NPS students and faculty also visited Embry Riddle Aeronautical University (ERAU), Center for Aerospace Resilient Systems (CARS). The ERAU research faculty presented various innovative research efforts that are addressing issues in both aviation and space. This visit provided the students with the opportunity to see the research work performed by other students and allowed the NPS faculty to build relationships with the ERAU faculty, which may lead to future collaboration.



Touring the Laboratories at Embry Riddle Aeronautical University.

The PD21 course of study includes both the business (leadership, marketing, organizational processes, finance & managerial accounting, project management, manufacturing, operations management) and the technical (systems engineering, systems architecture, engineering risk analysis, systems optimization) aspects of services, systems, or product development. By integrating both engineering and management elements, the program strives to develop a new kind of leader with a holistic perspective and knowledge of systems, services, and product development. Students acquire the fundamental skills and strategic perspective required of effective innovators and change agents in their organizations.

For more information about the PD21 program, please contact Dr. Wally Owen, wowen@nps.edu or Dr. Kristin Giammarco, kmgiamma@nps.edu.

SE Faculty Supports Energy Resilience Tabletop Exercise in the Philippines

Systems Engineering Department associate professor Dr. Douglas Van Bossuyt and faculty associate of research Nelson Emmons recently returned from supporting the Joint Inter-Agency, Inter-Governmental Energy Resilience and Readiness Tabletop Exercise in the Municipality of Basco, in the Province of Batanes, in the Republic of the Philippines. The event was organized by the Naval Postgraduate School's Energy Academic Group Mr. Charles B. Lynn in partnership with the Provincial Government of Batanes through the Provincial Disaster Risk Reduction and Management Office. Nelson and Douglas supported the week-long tabletop exercise with their expertise in energy systems.



From left to right: Dr. Douglas L. Van Bossuyt (NPS SE Dept), Mr. Charles B. Lynn (NPS EAG), Mr. Nelson Emmons (NPS SE Dept), Capt Christopher Reardon (NPS NSA Dept), MAJ Kyle Schulz (NPS IW) in the Basco Municipal Hall conference facility during the Tabletop Exercise.

NPS Faculty Attend NAS Sigonella Nanogrid Design Review

NPS faculty members Dr. Douglas L. Van Bossuyt (associate professor, systems engineering) and Dr. Giovanna Oriti (professor, electrical and computer engineering) recently attended a design review for the Navy's first nanogrid that is slated for construction at Naval Air Station Sigonella. The nanogrid has been designed based upon principles developed at the Naval Postgraduate School by Dr. Oriti, Dr. Van Bossuyt, and many other professors and students plus colleagues at the University of Wisconsin Milwaukee and the University of Pavia over the past five years. It takes the concept of zonal shipboard power and brings it ashore in a way that allows for small, incremental improvements to be made to existing electrical utility infrastructure at Navy bases. More information is available at <https://microgrid.nps.edu/>



From left to right, Dr. Norma Anglani (University of Pavia, Mr. Antonio Piluso (NAS Sigonella), Dr. Douglas L. Van Bossuyt (rear, NPS SE Dept), Dr. Giovanna Oriti (front, NPS ECE Dept) outside NAS Sigonella with Mount Etna in the background.

Students and Faculty articles

<https://www.nps.edu/web/guest/-/nps-researchers-recognized-for-modeling-integrated-deterrence-in-indopacom-region>

<https://www.mors.org/Publications/Phalanx/Current-Issue>

Functional Failure System Design Survey Paper Published in ASME Journal of Computers and Information Science in Engineering

Dr. Douglas L. Van Bossuyt (Naval Postgraduate School department of systems engineering) and his colleagues Dr. David Jensen (University of Arkansas), Dr. Oladapo Bello (Corning Research and Development Corporation), Dr. Bryan O'Halloran (independent consultant), and Dr. Nikolaos Papakonstantinou (Fortum, Finland) recently published a survey paper in the American Society of Mechanical Engineering's Journal of Computers and Information Science in Engineering on the topic of function failure identification and propagation (FFIP) analysis methods for system design. The paper documents the last 20 years of development of FFIP as a system design and analysis method. The authors all started working with FFIP while they were pursuing their doctoral studies and have worked together for many years on continuing to develop FFIP extensions along with a diverse and vibrant international research community. The abstract of the paper is as follows:

In the context of model-based product and system design, the capability to assess the impact of potential component faults, undesired interactions, and fault propagation is important for design decision-making. Addressing these potential negative outcomes should occur as early in the design process as possible to enable designers to make impactful changes to the design. To this end, a set of tools and methods have been developed over the last 20 years that leverage a function-based approach assessing the potential faults and fault propagation and develop system health management strategies. These tools and methods must overcome challenges of high abstraction and satisfaction of safety or risk requirements with limited design specification. This paper provides a detailed survey of a particular function-based analysis tool as a lens to understanding the challenges for other tools in this domain. Specifically, development and evolution of the Function Failure Identification and Propagation Framework (FFIP) is used as a lens to survey the challenges of this field. The objective of this paper is to explore the specific challenges and advancements of the FFIP framework and related tools that address similar modeling and analysis challenges. We provide an overall categorization and summary of the research efforts to date and identify specific known limitations and unaddressed challenges in the area of design-stage system risk and safety analysis.

The complete article can be found at: <https://doi.org/10.1115/1.4065630>

The article citation is:

Jensen, David, Douglas Van Bossuyt, Oladapo Bello, Bryan O'Halloran, and Nikolaos Papakonstantinou. "A Survey of Function Failure Identification and Propagation Analysis Methods for System Design." Journal of Computing and Information Science in Engineering (2024): 1-51.

Faculty Receives Letter of Commendation



On May 22nd Professor Practice Don Muehlbach received a Letter of Commendation signed by Scott Gartner (NPS Provost and Chief Academic Office) in recognition for being “one of our students’ favorite professors”.

The letter read in part: “Based on the recommendation of the Committee for the RADM John J. Schieffelin Award for Excellence in teaching, it is my pleasure to recognize you as being in the top 5% of the faculty considered for the award. In all, 219 of our teaching staff were considered for the Schieffelin Award.”

Muehlbach is a 2013 recipient of the Rear Admiral John Jay Schieffelin Award for Teaching Excellence, Naval Postgraduate School.

Awards and Graduations

Outstanding Thesis

ENS Ryan W. Plickys, USN

Theses

ENS William J. Davis, USN

Title: MEASURING SURFACE SHIP MISSION EFFECTIVENESS FOR A GREENER FLEET

Advisors: Hyatt Moore (Co-Advisor), Ronald Giachetti (Advisor)

LT Ryan Herrmann

Title: INTEGRATING NPS MICROGRID TOOLS INTO MILITARY INSTALLATION ENERGY RESILIENCE TABLETOP EXERCISES

Advisors: Douglas Van Bossuyt (Advisor), Eric Hahn (Co-Advisor)

LT Leonardo Jofré, Chilean Navy

Title: INITIAL CONCEPTUAL DESIGN OF A SURFACE COMBAT SHIP IN SUPPORT OF THE NATIONAL CONTINUOUS SHIPBUILDING PLAN OF THE CHILEAN NAVY

Advisors: Mark Stevens (Advisor), Douglas Van Bossuyt (Second Reader)

ENS Jacob P. Lowe

Title: NAVAL APPLICATIONS OF SPACE-BASED SOLAR POWER: A SYSTEMS ENGINEERING APPROACH

Advisors: Bonnie Johnson (Advisor), Theodore Jaeger (Co-Advisor), Paul Jaffe (Second Reader)

ENS Ryan W. Plickys

Title: FEASIBILITY OF USING EXPERIMENTAL LOAD MEASUREMENTS ON A CYLINDER TO PERFORM PHASE-SENSITIVITY ANALYSIS IN THREE-DIMENSIONAL FLOWS

Advisors: Joseph Klamo (Advisor), Kunihiko Taira (Co-Advisor)

LT Gabrielle Smith

Title: INVESTIGATION OF ZONAL NANOGRIDS FOR IMPROVED MILITARY INSTALLATION ENERGY RELIABILITY

Advisors: Giovanna Oriti (Co-Advisor), Douglas Van Bossuyt (Advisor)

Systems Engineering Analysis Capstone Project

Title: DESIGN, ENGINEERING, AND ASSESSMENT OF MOBILE MINEFIELDS

Students: LT Chi Hsuan Chu, Lt Col Fábio Diego Matias de Souza, CDR Erik C. Kowalski

Advisors: Jefferson Huang (Co-Advisor), Ronald Giachetti (Advisor)

SEA Capstone Team

Title: DESIGN, ENGINEERING, AND ASSESSMENT OF MOBILE MINEFIELDS

Advisors: Ron Giachetti and Jefferson Huang

Students: Hong Yu Chang, Xiang S. Chee, Hui Yang Chew, Chi-hsuan Chu, Willie Clark II, Sara Ford, Thomas L. Glade, Jin Hong Alvin GOH, Jun Jie Khng, Ivan Zi Yin Ko, An Song Koh, Erik C. Kowalski, Cheow Yong Wilfred Lee, Jun Jett Lim, Kaijian Lin, Fabio D. Matias de Souza, Brendan J. Metcalf, Elizabeth A. Neilson, Zhi Hao Ong, Yonatan Sigal, He Jiang Tan, Zong Yew Yee

Graduations

Master of Science in Systems Engineering (DL)

Ms. Sara Ford, Naval Sea Systems Command, Division Keyport

Ms. Elizabeth Ann Neilson, United States Army Combat Capabilities Development Command

Master of Science in Systems Engineering (Resident)

ENS William J. Davis, USN

LT Ryan Herrmann, USN

ENS Jacob P. Lowe, USN

ENS Ryan W. Plickys, USN

LT Leonardo Jofré, Chilean Navy

LT Gabrielle Smith, USN

CDR Erik C. Kowalski, USN

Master of Science in Systems Engineering Analysis (Resident)

Lt Col Fábio Diego Matias de Souza, Brazilian Air Force

LT Chi Hsuan Chu, Taiwan ROC Navy

Systems Engineering Graduation Photo



Request for Alumni News!

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

If you would like to subscribe to the Systems Engineering Newsletter, please click [here](#).

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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.
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