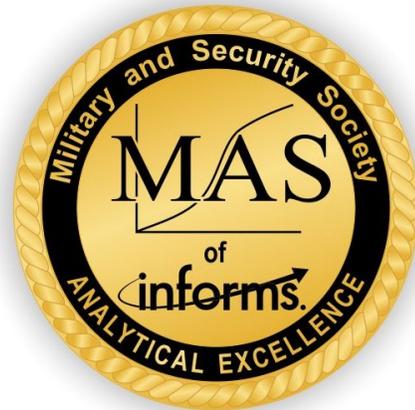




## Newsletter

Volume 2021, Number 3 (September)



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## President's Column

- *Brian J. Lunday*

The last 18 months of the COVID-19 pandemic have presented many challenges, and also a few great opportunities. With the increased social distancing and emphasis on telework that many of us have embraced, there has been a bit more solitude during which we can reflect. Moreover, the threat of a viral pandemic naturally induces reflection on what's important to us, both professionally and personally.

In July, I had a wonderful opportunity to give a joint presentation with Brian Morgan (Past-president of the Military Operations Research Society) about professional societies to a webinar hosted by the Air Force Analytic Community. In addition to sharing the benefits of participating in INFORMS, MAS, and MORS, we spoke with the audience about the societies' opportunities for professional mentoring, both from the mentor and mentee roles.

As we prepared for the event and for days afterward, I could not help but reflect on the important colleagues who've provided valuable mentorship to me. As one example, I'll mention U.S. Army Colonel Kathi Snook, PhD, who taught in the Department of Mathematics at West Point from 1987-1991 and 1996-2002. During my first year teaching calculus there in 2001-2002, I grew a bit frustrated when noticing a lack of effort by some students, skipping readings and not giving their best effort on homework. Late in the fall semester, Kathi spoke to a small group of us, noting her early frustration with the same trend and sharing her experience. When she had expressed the same concerns in 1987 to her husband, another instructor, he politely chided: "Students never did those things in undergraduate studies, Kathi. You did. That's why you're back here to teach and help others." What was the lesson? Students are not – and should not be expected to be – a reflection of their instructor. They have their own relative gifts, strengths, and priorities, and their professional path will differ. A bit of empathy on that point will go a long way towards understanding and best helping them on their own paths.

So what do I ask of you? First, please take a few minutes to recall someone who helped you along your professional path. Second, think about the specifics of a single event that impacted you. Finally, reach out to that person, remind them of it, and thank them.

I've shared my first two steps with each of you. I'll complete the third one before the INFORMS Annual Meeting this October. And I look forward to seeing you there, whether virtually or in-person!

## MAS Council Members

Shown below are your elected officers and their respective terms of office. If you have ideas for our society to consider, please bring them to our attention! We meet virtually on the fourth Wednesday of each month.

### President



Brian Lunday  
2021-2022

### Vice-President/ President-elect



Shaun Doheney  
2021-2022

### Secretary/Treasurer



Walt DeGrange  
2021-2022

### Past President/ Awards Committee Chair



Natalie Scala  
2021-2022

### Council Member



Nathaniel Bastian  
2019-2022

### Council Member



Mark Gallagher  
2019-2022

### Council Member



Paul Goethals  
2019-2022

### Council Member



William Caballero  
2021-2024

### Council Member



J.D. Robbins  
2021-2024

### Appointed for Industry Liaison



Alicia Bridges  
2021-2022

### Appointed for Webinar Development



Fred Woodaman  
2021-2022

### Social Media Coordinator



Garrett Alarcon  
2021-2022

## Upcoming Events

Date(s)	Time	Event	Notes
Oct 20	1600-1700 EDT	Annual MAS Business Meeting	MAS leadership will recognize annual award recipients, share information about MAS initiatives, and address member questions. All MAS and interested INFORMS members are invited! The meeting link for this Zoom meeting will be disseminated via INFORMS Connect.
Oct 24-27	n/a	INFORMS Annual Meeting	MAS currently has 10 sessions of ~40 presentations. Look for the detailed schedule in late September at <a href="https://meetings2.informs.org/wordpress/anaheim2021/schedule/">https://meetings2.informs.org/wordpress/anaheim2021/schedule/</a> .
Dec 12-15	n/a	INFORMS Winter Simulation Conference	There will be an MAS-sponsored track of research presentations. Look for more information via INFORMS Connect or contact either Andy Hall ( <a href="mailto:andrew.hall@marymount.edu">andrew.hall@marymount.edu</a> ) or Nate Bastian ( <a href="mailto:nathaniel.bastian@fulbrightmail.org">nathaniel.bastian@fulbrightmail.org</a> ) for more details.
Dec 16	1200-1300 EST	Webinar: 2021 Koopman Prize	Live research presentation by the 2021 Koopman Prize Recipients on their award-winning research published in 2020. The registration link for this Zoom webinar will be disseminated via INFORMS Connect.
Jan TBD	1200-1300 EST	Webinar: 2021 Bonder Scholarship & Steinhardt Prize	Live research presentation by the 2021 Bonder Scholarship recipient and the 2021 Steinhardt Prize recipient. The former speaker will talk about their developing research thread supported by the scholarship, and the latter speaker will share insights and observations from a career of operations research and related contributions to military and security applications. The registration link for this Zoom webinar will be disseminated via INFORMS Connect.

## Secretary/Treasurer Notes

*(No change since last newsletter.)* As of June 2, 2021, MAS has 185 members representing 39 US states. The state with the most MAS members is Virginia with 35, and the second most is California with 18. As of December 2020, the MAS financial balance for its last audited statement is \$9,435.

## Recent Member Publications in INFORMS & MAS-sponsored Journals

MAS members are doing great research, and some of it is surely being disseminated in INFORMS and MAS-affiliated journals. If you've published research in 2021 in one of the 16 INFORMS-sponsored journals (<https://pubsonline.informs.org/>) or in the journal *Naval Research Logistics* (<https://onlinelibrary.wiley.com/journal/15206750>), the latter of which has a Security Area sponsored by MAS, please contact MAS Council Member J.D. Robbins at [matthew.robbins@afit.edu](mailto:matthew.robbins@afit.edu) so we can recognize and highlight your work to your MAS colleagues!

## MAS Undergraduate-level Student Award Recipients

MAS is proud to honor the following outstanding 2021 graduates in operations research at selected United States service academies.

### **US Air Force Academy: Second Lieutenant Miranda (Andi) Ahlers**

2d Lt Andi Ahlers is originally from St. Louis, Missouri. During her time at the Air Force Academy, she completed a cadet summer research program with the Air Force Special Operations Command/Analysis Directorates, working to develop a computer algorithm capable of generating a baseline ranking of individuals under consideration for key positions within AFSOC. Her capstone Operations Research project was in conjunction with the University of Munich and developed a decision support system for efficient placement and transportation of known casualties, which offered guidance for rapid transportation and was based on innovative artificial intelligence inference and transportation systems frameworks. Her work was published and accepted to the 12th International Conference on Applied Human Factors and Ergonomics (AHFE 2021). She is currently enrolled in the masters Technology and Policy Program at MIT.

### **US Naval Academy: Ensign Leonard Pick and Ensign Micah Oh (tie)**

ENS Micah Oh's senior project examined the importance of the Spratly Islands due to the tense political environment of the South China Sea. He explored a variety of methods for determining the value of each island in the Spratlys, including a mixed integer programming model to find a network tree of occupied islands that maximizes the total value of occupied islands in an island chain. His results show that a specific set of islands is consistently most cost effective. He continues his education at the US Naval Postgraduate School this fall.

ENS Leonard Pick is originally from Palm Beach Shores, Florida. He services selected submarines and will be going to Charleston after completing a masters in applied mathematics and statistics at Johns Hopkins University. His research at the USNA consisted of creating and optimizing a Q-learning algorithm for an autonomous vehicle to assess its feasibility in non-deterministic environments.

### **US Coast Guard Academy: Ensign Ryan Yoo**

ENS Ryan Yoo is currently stationed at Coast Guard Sector San Francisco, serving as a marine inspector. As a member of the Prevention Department, he will undertake an 8-month qualification process to ensure vessel safety and compliance. Following that, he will begin qualifying to inspect commercial barges and hopes for a follow-on assignment in the Marine Safety field.

**US Military Academy: Second Lieutenant Marie Docken**

2LT Docken graduated from the Department of Mathematical Sciences with a major in Operations Research. She participated in swim and dive while at West Point, and her next assignment is in Vicenza, Italy as an officer in the Corps of Engineers.

## MAS Graduate-level Student Award Recipients

MAS expanded the scope of our student recognition program, sponsoring two new inaugural awards: the *Professor Gregory S. Parnell Outstanding Thesis Award* at the Air Force Institute of Technology and the *Professor Donald P. Gaver, Jr. Outstanding Thesis Award* at the Naval Postgraduate School. Each award winner receives a plaque from MAS along with the congratulations of the society. The 2021 award winners are as follows.

**US Air Force Institute of Technology: Capt Justin Anderson**

Captain Justin L. Anderson is the personnel policy analyst for Manpower, Personnel and Services, Headquarters U.S. Air Force, Pentagon, Arlington, VA. His thesis at AFIT sought an optimal upgrade schedule to maximize network resilience in support of nuclear command, control, and communication network (NC3) modernization, given a contested network and a portfolio of network upgrades. The NC3 network provides an effective deterrent against adversaries by maintaining robust communication between assets, operators, and decision makers. His research contributes a model that solves a budget constrained network upgrade scheduling problem (NUSP). The NUSP is a defender-attacker-defender tri-level optimization model that achieves fortification via selecting and scheduling network upgrades. The lower-level defender problem is the shortest path problem, the mid-level attacker problem is the shortest path interdiction problem (SPIP), and the upper-level defender's problem is the NUSP. He presented an exact, solvable solution method and propose a simulated annealing (SA) heuristic. The formulation is applied to a large network instance and using four scenarios, investigated the effects of attacker budget and risk profiles on the optimal upgrade schedule. Results indicate that both attacker budget and risk profile affect the optimal acquisition strategy. Moreover, the optimal upgrade schedule provides greater network resilience than the baseline greedy upgrade schedule.

**US Naval Postgraduate School: Teniente Primero (LCDR) Cedric G. Gibbons Mac-Lean of the Chilean Navy**

Before being given the opportunity to study Operations Research at the Naval Postgraduate School, LCDR Gibbons was assigned to the Operational Analysis Department of the Directorate of Programs Innovation and Development of the Chilean Navy (DIPRIDA), where returned after graduating from NPS in June 2021. His graduate thesis addressed the allocation of bikes in a bike-sharing system, where customers arrive to a rack in the system network to take or leave bikes. The bike sharing operator restocks each rack overnight with a certain number of bikes,

where his goal is to minimize expected unsatisfied demand. The unsatisfied demand may occur when all the rack slots are occupied by parked bikes and a user that is using one has to go somewhere else to drop it, or in the case where the rack is empty and a user who wishes to take a bike walks away empty handed. His work estimated the number of bicycles on a generic rack at the beginning of the day to minimize the expected number of unsatisfied users, in a setting where the operator has no prior knowledge of the bike arrival and departure stochastic processes. The algorithm relies on machine learning to explore and exploit the decision space optimally over the time horizon of interest.

## Member Spotlight: MAS Student Members who earn their PhD

**Name:** Adam Haywood, PhD

**Current Title, Organization:** Operations Research Analyst, Air Force Warfighting Integration Capability (AFWIC)



**Tell us about your recent accomplishments and your professional goals.**

Most recently, I successfully defended my dissertation entitled “Enterprise Resource Allocation for Intruder Detection and Interdiction” to earn my PhD from the Air Force Institute of Technology. I am greatly looking forward to joining AFWIC later this year and beginning my career as a part of the Air Force’s civilian workforce.

**What are some of your research interests?**

During the formation of my dissertation, I discovered the world of multi-objective optimization genetic algorithms (MOO GAs) while searching for a method to solve a multi-objective mixed-integer nonlinear program. I found this area of literature to be extremely interesting, and I suspect that any future threads of literature stemming from my dissertation will make use of MOO GAs due to the high-quality solutions that they provided during my research.

**What hobbies or interests do you have when you are not working?**

During the pandemic I discovered the sport of triathlon, which provided me with plenty of physical exercise to keep me busy while I finished my dissertation. I also enjoy watching Marvel movies and the various spin-offs.

**What is the best advice that you have received? What advice do you have for students considering Operations Research as part of their education?**

As someone whose brain sometimes works a little faster than my mouth, I’ve embraced the “slow down and listen first” mentality that I observed from others throughout my education. I aim to fully process whatever information is coming my way and then form a best response,

otherwise I risk not actually gaining the important information in the first place. For OR students, I encourage you to keep an open mind about various methodologies even if they are not your favorite at first.

**What do you see are the benefits of being a MAS member?**

Mainly, it is great to connect with others in a similar field who share similar interests. Throughout my education, there were times when there were not many others who shared the same passion for my research interests. MAS is a great place for gaining that connection.

Do you advise a doctoral candidate and MAS member who is soon-to-graduate or has recently graduated? Do you know a colleague in that same category? If so, MAS would like to include a “Member Spotlight” in its newsletter to highlight their research and their professional goals. Please e-mail MAS Council Member Paul Goethals at [paul.goethals@westpoint.edu](mailto:paul.goethals@westpoint.edu) for more details.

**Industry Spotlight**

This quarter’s industry spotlight is ITA International (ITA), a global service provider leveraging subject matter expertise, data analytics and technology, to ensure mission success for customers, “In The Arena.” The ITA Data Solutions (ITADS) team, headquartered at the ITA Data Analytics Center (ITADAC) in Newport News, Virginia, provides statistics, machine learning and software engineering to deliver customers value added and focused data analytic solutions.



A cadre of ITADS senior operations research analysts in technical leadership positions direct the work of technical teams which drive organizations to better results by supporting customers’ analytic needs and requirements. Some examples of the military work ITADS supports includes performing scenario analysis and/or wargaming techniques to explore the interaction between resourcing decisions and customer-specified operational mission threads.

Recently, this September, ITA celebrated 16 years of solving complex world issues for clients using data and dialogue to, “Operationalize Data to Improve the World.”

“I am excited to see what the future holds as we strive to improve the lives of all people by working towards a secure, stable and sustainable world,” said Mike Melo. “ITA began as a global security company supporting the Department of Defense and Department of Homeland Security. As we expand to the growing environmental security market, I believe it’s time to bring subject matter experts and data analytics together to solve complex global issues and make a difference.”

Learn more at <https://ita-intl.com/>.

## Call for Member Ideas

What would you want to see in a newsletter? Do you have suggestions for upcoming webinars? Do you have suggestions for featured articles or member spotlights? We welcome your suggestions! Please e-mail the MAS President, Brian Lunday ([brian.lunday@afit.edu](mailto:brian.lunday@afit.edu)) or the MAS Vice President/President-elect, Shaun Doheny ([shaun.doheny@gmail.com](mailto:shaun.doheny@gmail.com)) with your ideas for the MAS Council to consider!