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Midshipman Research Poster Session



**U.S. Naval Academy
Dahlgren Hall
14 Dec 2021**

- 0830-0900 Open poster viewing
Mids are free to view other posters and talk to classmates about research.
Guests can view posters.
- 0900-1030 All mids must stand by their posters and discuss their research with faculty
and guests.

These midshipmen are enrolled in independent research courses (XX495 or Trident) or honors courses, and have been working with USNA faculty on projects in many areas, including those of interest to the Navy. This unique learning experience allows midshipmen to apply their classroom knowledge to new areas and important problems as well as develop their critical thinking skills. Today, we celebrate their accomplishments and contributions.

By current USNA policy, masks must be worn inside all USNA venues regardless of vaccination status.

POSTER #	MIDN Presenter(s)	Major	Poster Title	Adviser(s)
1	John McCarthy	Robotics and Controls Engineering	Using simulated optical turbulence to produce training data for UWOCs	S. Avramov-Zamurovic
2	Boris Atud	Robotics and Controls Engineering	Modeling Human Trust in AI	T. Severson, E. Rodriguez-Seda
3	Jacob Barberio ^B	Robotics and Controls Engineering	Determining Key Factors in Professional Football Outcomes Using Artificial Neural Networks	R. Broussard
4	Jude Vitrano	Robotics and Controls Engineering	LSTM Neural Networks for use in UAV Trajectory Prediction (Project MIDKNIGHT)	J. Esposito
5	Cade Wright	Robotics and Controls Engineering	Effector Fault Detection for Control Reconfiguration in Unmanned Surface Vessels	K. Kiriakidis, T. Severson
6	Erik Younkin	Robotics and Controls Engineering	Adaptation in Autonomous Vehicles	K. Kiriakidis, T. Severson
7	Jennifer Nguyen ^B	Robotics and Controls Engineering	Rigid Formation Control of Unmanned Marine Vehicles	M. Feemster, P. Frontera
8	Andreas Casillas ^B	Robotics and Controls Engineering	Magnetic Localization to Support UUV Docking	P. Frontera
9	Camille Volk	Robotics and Controls Engineering	Modeling the Cardiovascular System	P. Jaramillo, R. O'Brien
10	Aidan Alejandro	Robotics and Controls Engineering	Testing the Physical Performance of COVID Recovered Midshipmen	P. Jaramillo
11	Stephen Brower	Robotics and Control Engineering (Honors)	Kingfisher: A Bio-Inspired, Aquatic, Diving Unmanned Aerial Vehicle	B. Bishop
12	George Heinen	Robotics and Control Engineering (Honors)	Project MidKnight: Evaluation Using Monte Carlo	M. Feemster
13	Cameron Smith ^{T,B}	Robotics and Control Engineering (Honors)	Characterizing Tandem Fin Wake Using a Lateral Line Inspired Sensor	M. Murray, D. Fredriksson, L. DeVries, A. Laun
14	Nicholas Forsys	Robotics and Control Engineering (Honors)	Autonomous Nature-inspired Grasping Launch and Recovery (ANGLaR) System for Aerial Deployment and Retrieval of Underwater Vehicles	B. Bishop
15	Will Jarrett ^{T,B}	Robotics and Control Engineering (Honors)	Machine Learning-Based Design of Structured Laser Light for Underwater Wireless Communication	S. Avramov-Zamurovic, J. Esposito
16	Samuel Gdowski	Robotics and Control Engineering (Honors)	Predicting NCAA Men's Basketball Games using Artificial Neural Networks	R. Broussard
17	Sean Kee	Robotics and Control Engineering (Honors)	Upper Body Running Kinematics Estimation with Sparse IMU Sensors	J. Esposito
18	Victoria Tran	Robotics and Control Engineering (Honors)	Enabling Robotic Conformal Additive Manufacturing: Hardware Co-calibration using Multiple View Geometry	M. Kutzer, L. Devries
19	Dylan Black	Aerospace Engineering	PIV Flowfield Analysis of Rotors Hovering above Moving Surfaces	J. Milluzzo
20	Hunter Greenwood	Aerospace Engineering	Satellite Pose Estimation using Convolutional Neural Networks	T. Lim

POSTER #	MIDN Presenter(s)	Major	Poster Title	Adviser(s)
21	Logan Schoffstall ^T	Aerospace Engineering	Effects of Gamma Radiation on the Thermal and Mechanical Properties of Additively Manufactured Thermoplastics	P. Joyce
22	Alex Romano	Aerospace Engineering	Distance Simulation Method for Laser Wireless Power Transfer	M. Sanders, J. Kang
23	Ross Massey	Mechanical Engineering	Elastocaloric Refrigeration Experimental Redesign	A. Smith
24	Bennett Moudy	Mechanical Engineering	Signal Transmission Using Piezoelectric Transducers Through a Solid Medium	J. Radice
25	Lindsey Asbury	Mechanical Engineering	Mechanical Properties of Carbon Fiber/Phthalonitrile Composites	P. Joyce
26	Skyler Schork ^T	Mechanical Engineering	Machine Learning Enabled Prediction of Optical Turbulence	J. Burkhardt, C. Brownell, C. Nelson
27	Anna Sewall ^B	Mechanical Engineering	Submarine Auxiliary Waterjet Propulsion	B. McFarland
28	Jack Dabek ^B	Mechanical Engineering	Determination of the Aerodynamic Roughness Length at the Air-Sea Interface	K. Flack
29	James Potticary ^T	Mechanical Engineering	Fabrication and Characterization of an Additively Manufactured Thermoelectric	B. Baker, E. Retzlaff, P. Joyce, H. ElBidweihy
30	Katie Lupo ^B	Mechanical Engineering	Compression Behavior of Electroplated Additive Manufactured Lattices of Various Resins	E. Retzlaff
31	Derrick Thompson ^B	Mechanical Engineering	Additive Manufacturing of O-Rings	J. Cowart, D. Luning Prak
32	Victor Wang ^B	Mechanical and Nuclear Engineering	The Effect of Corrosion on Coating Adhesion	J. Schubbe
33	Alexander Carter ^B	Mechanical and Nuclear Engineering	Optimizing the Concept of Operations for Aerial Radiation Surveys in an Urban Environment	M. Millett
34	Nathan Matalavage ^B	Mechanical and Nuclear Engineering	Evaluating Organic Scintillators for use with Unmanned Aerial Vehicles	M. Schell, M. Millet
35	Nicholas Kennedy ^B	Mechanical and Nuclear Engineering	Determining Ship Effect Background for Underwater Neutron Detection	M. Schell, M. Millet
36	Young-Uk Kim	Nuclear Engineering	Novel Treatment of Residual Decay Heat after Shutdown	S. Blair
37	Noah Byrne ^B	Nuclear Engineering	Estimates of dose due to cosmic radiation using the MCNP6.2 code	S. McHale
38	Katelyn Majors ^B	Nuclear Engineering	Desalination of Sea Water Utilizing Recovered Waste Heat from a Lead-cooled Small Modular Reactor	M. Cerza, M. Murray
39	Sara Perkins	Nuclear Engineering	Localized Methods for Calibrating Neutron Sources Utilizing Capture Gamma Detections	M. Schell, M. Millett
40	Luke Lhota	Nuclear Engineering	Effect of the Built Environment on the Atmospheric Neutron Background and Homeland Security Surveillance	J. Burkhard, M. Millett
41	Amelia Scigliano	Nuclear Engineering	Liquid Nitrogen Cooled Cloud Chamber	M. Schell

POSTER #	MIDN Presenter(s)	Major	Poster Title	Adviser(s)
42	Gabriel Stevens ^B	Electrical Engineering	Characterization of Scintillators for Portable Radiation Detection	H. ElBidweihy, B. Jenkins, D. Mechtel
43	Janushaa Bala Krishnan Muthiah	Electrical Engineering	Powering A Biosensor	E. Chapman
44	Jon Copley	Electrical Engineering	Additively Manufactured RF Lenses For Highly Directive, Low Power Transmitters	A. Smith, H. ElBidweihy, D. Mechtel
45	Nicholas DiNofrio	Electrical Engineering	Using Fiber Optic Rotary Joints to Transmit Information over Rotating Parts	B. Jenkins, C. Nelson, P. Joyce
46	Ben Stanish	Electrical Engineering	Using Laser Velocimetry to Characterize the Flight of High-Speed Projectiles	C. Nelson, B. Jenkins, C. Brownell
47	Luis Medina	Electrical Engineering	Scintillation Reduction using Incoherent Beam Combination	C. Nelson, S. Avramov-Zamurovic
48	Isaiah Camacho	Electrical Engineering	Optimization of N-Polar GaN Contacts	C. Martino
49	Guillermo Pass-Robles	Electrical Engineering	Vertical GaN Schottky Diode Stress Testing	C. Martino
50	Jennifer Jung	Computer Engineering	Deep Neural Networks for Animal Activity Classification	J. Blanco, C. Delozier, R. Rakvic, J. Shey
51	Josh Ralston	Computer Engineering	Design of a Parallel-Pipeline Architecture With Pixel Forwarding Technique for Real-time Lane Detection	H. Ngo
52	Mike Kurp	Computer Engineering	Area Efficient Hardware Implementation of R-LWE Cryptography	J. Shey
53	Samantha Chan ^B	Ocean Engineering (Honors)	Physical and Theoretical Modeling of Wave Attenuation through a Mangrove Forest	V. Johnson, A. Wargula
54	Jamison Julian	Ocean Engineering	Service Kayak	F. Chapman, R. Tran
55	John Bowers	Ocean Engineering	Geometric Optimization of Heaving Oscillating Water Column for Wider Resonant Bandwidth	A. Gish
56	Ryan Fitzgerald	Ocean Engineering	Operational Study of Signature VM	A. Wargula
57	Brinley Harrison ^B	Ocean Engineering	Physical and Biological Suitability of Integrating Aquaculture with Offshore Wind Farms in the Gulf of Maine	D. Fredriksson
58	Colin Brennan	Ocean Engineering	Modeling the Morphological Evolution of Breached Bar-Built Estuaries	L. Velasquez, M. Orescanin
59	Jeremy Kmita ^B	Ocean Engineering	Submarine Auxiliary Waterjet Propulsion: Ejector Analysis	B. McFarland
60	Justin McCabe	Ocean Engineering	FILSIM Model for Predicting Beach Changes	A. Wargula
60 ½	Jessica Nangle	Ocean Engineering	Erosion Alternatives for a Tidal Inlet	L. Velasquez, A. Wargula
61	Colin McMann	Naval Architecture and Marine Engineering	Seakeeping of an Unmanned Offshore Supply Vessel	C. Judge
62	James Selby	Ocean Engineering	Comparison of Turbines for an Oscillating Water Column	A. Gish

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63	Isabelle Ross ^B	Naval Architecture and Marine Engineering (Honors)	Experimental and Computational Assessment of Current Forces on Moored Vessels in Shallow Water	A. Metzger
64	Oliver Smith	Naval Architecture and Marine Engineering	Impact of Post-Damage Stability on Maneuvering Performance	C. Judge, B. Beaver
65	Meade Tolen	Naval Architecture and Marine Engineering	Dry Combat Submersible External Storage	J. Gibbs
66	Zane Buono	Ocean Engineering	Design of External Storage Pods for US Navy Dry Combat Submersible	J. Gibbs
67	Teresa Collins ^B	Naval Architecture and Marine Engineering	Simulation of External Storage Pods for Navy Submersible	J. Gibbs
68	Derek Keglovits	Oceanography (Honors)	Factors Influencing Variability in Surface Water Chemistry and Material Fluxes Through Rivers and Streams on the North Slope of Alaska During the Open Water Season	S. Gallaher
69	Jordan Jeletic	Oceanography (Honors)	The upper ocean response to Hurricane Teddy (2020) as measured by ALAMO floats	E. Sanabia
70	Julia Davis	Oceanography (Honors)	Evolution of the surface wave field in Hurricane Teddy (2020) from an array of ALAMO floats	E. Sanabia
71	Gregory Peterson	Oceanography (Honors)	Wave measurements in ALAMO floats	E. Sanabia
72	Jonathan W. Harding, Louis C. Hunter, James D. Sills	General Science	Tampa Bay Algae Monitoring	P. Guth
73	Kade Heckel ^T	Computer Science and Computer Engineering	Competitive Memory Transformers for Network Intrusion Detection	F. Crabbe
74	Courtney Tse ^B	Computer Science & Information Technology	Differentially Private Graph Statistics	S. Choi, A. Crainiceanu, D. Roche
75	Sam Laney ^T	Computer Science	Participant and Channel Privacy in End-to-End Encrypted VoIP Teleconferencing	D. Roche, T. Mayberry, J. Blanco
76	Krystal Kim ^B	Computer Science	Unmanned Counter Swarm Tactics Using Deep Reinforcement Learning	F. Crabbe
77	Cam Cook	Cyber Operations	The Case for a Calls-for-Fire Model of Tactical Cyber Operations	M. Libicki
78	Adrian Schalk	Cyber Operations	Navigating Future Cooperation with China in Space and Cyber	M. Libicki
79	XiaoJiao Hall, Nikhil Vasan	Mathematics and Computer Science	Connections Between Graph Theory and Matroid Theory	C. Chun
80	Caroline Turner ^T	Operations Research (Honors)	Temporal Network Analysis of Concussion Symptoms in Collegiate Athletes	A. Svirsko

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81	Joe Spirnak	Mathematics (Honors)	Impulsive Differential Equations with Applications to the Pulse Vaccination Strategy of the SIR Model	I. Popovici
82	R.E. Manhertz	Mathematics (Honors)	Dynamical Systems with Delayed Response: Foundations	I. Popovici
83	Paul Zimmer	Mathematics	Knot Invariants and Chern-Simons Theory	M. Im, V. Nguyen
84	Sarah Sorensen ^T	Operations Research, Quantitative Economics	Ensuring Equitable Access to Liver Transplantation Using Duality, Network Flow and Simulation	S. Gentry, N. Wood
85	Nicolas Duchez	Applied Mathematics (Honors)	Neural Networks for Solving Partial Differential Equations	A. Soane
86	Kyle Jung ^T	Applied Mathematics (Honors)	An Analytical and Computational Study of the Paraxial Wave Equation with Applications to Laser Beam Propagation	R. Malek-Madani, S. Avramov-Zamurovic
87	Camille Herman	Applied Mathematics	Swarm Dynamics on General Riemannian Manifolds	K. Medynets
88	Ragan Leslie	Astrophysics	Determining the Rotational Period of the Near Earth Asteroid 2000 WY28 Using its Lightcurve	J. Larsen
89	Brandon Diep	Astrophysics	Determining the Rotational Period of the Near Earth Asteroid 2021 PB15	J. Larsen
90	Bonnie Tom	Physics	An analysis and testing of mechanics and kinematics of female athletes in the rugby scrum: a first principles based study	E. Chapman
91	Derek Gess	Physics	Electro-Optic HAN Device Utilizing Carbon Nanotube Arrays and 2D Hexagonal Boron Nitride Nanosheet as the Alignment Substrates	R. Basu
92	Taylor Gray	Physics	Measurement of Thin Film Conductivity Using Long Time Delay TDTR	B. Donovan
93	Rob Hare	Physics	Entanglement at USNA: Development of a polarization entangled photon source	P. Brereton, S. Rittenhouse, M. Manicchia
94	Troy Dewitt	Physics	Spins in 4H-SiC solid state defects	P. Brereton, S. Rittenhouse, M. Manicchia
95	Sydney Harrington	Physics	Optimizing Co-Tb Binary Phase Composition and Magnetic Properties	M. Jamer
96	Anthony Armad	Physics	Fabrication of ZrO ₂ Thin Films on Sapphire Substrates by Chemical Solution Deposition with Spin Coating Techniques	B. Donovan
97	Matthew Fox ^T	Physics (Honors)	Structural and Magnetic Properties of Fe-Pd and Fe-Ni Nanoparticle Biocomposites	D. Durkin, E. Cimpoiasu
98	Chad Richter	Physics (Honors)	Iron doped Cobalt Terbium Magnetometry	M. Jamer

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99	Wesley Nourachi	Physics (Honors)	Interpretable Machine Learning Design for Diffusion Modeling	K. McIlhany
100	Katie Baier, Michael Morell	Chemistry, Physics	Regulation of Human Endogenous Retroviral Activity	I. O'Carroll
101	Mary Chase	Chemistry	Evaluating the Impact of Solvent Exchange and Humidity on the Fate of Mesoporous Biocomposites	D. Durkin, P. Trulove
102	Briana Green, Reid Hatzmann, Carolyn Mang, Madison Milbert, Jadyn Tiracave, Victoria Volpe	Chemistry	Optimal Pre-run Warmup Protocol After Completion of Maximal Upper Body and Core Muscular Endurance Test	C. Copper, M. Wright
103	Jonathan Huang ^T	Chemistry	Electrochemical and Spectroscopic Investigations of Bismuth Ions with Sulfur-containing Biomolecules	G. Cheek, J. Schlessman
104	Sam Hupp	Chemistry	Identification and Separation of Hydrolyzable Tannins in Northern Red Oak Tree Leaves	B. Rehill, D. Dillner
105	Will Smiley	Chemistry	Analyzing Forever Chemicals and Their Degradation Products Using ESI-MS & ISE	R. Siefert
106	J.P. Schuchardt, Anthony Cossetti	Chemistry	Evaluation of atypical carbapenems against mycobacterial Ldts	L. Basta
107	Sydney Means	Chemistry	Antioxidant Properties of Ginkgo Leave Extract	V. Smith
108	Hunter Wood	Chemistry	Development of a Concurrent Tandem Catalytic Method for Microwave-Assisted Amidation of Aryl Bromides	A. MacArthur, S. Lin
109	Jarard Ford	Chemistry	Dyes and Pigments: Spectroscopy, Synthesis, Computations	J. Lomax
110	Clara Enniful, Sooheon Lee	Chemistry	Confidence and Correctness on Clicker Questions in a General Chemistry Course	M. Schroeder, M. Teichert, D. Bunce
111	Anders Gulbrandson	Chemistry	Antimicrobial Biocomposites Fiber-Welded with Lignocellulose Containing Silver Nanoparticles	D. Durkin, P. Trulove
112	Karla Guzman, Jeremy Friedel, Gabby Shacoski, William Ashe	Chemistry	Destruction of Organophosphorus Nerve Agents Using Metal Organic Frameworks (MOFs), and Synthesis of Energetic Binders for Rocket Propellant	C. Whitaker, P. Caton
113	Nicholaus Adams	Chemistry	Characterization of Additive and Traditionally Manufactured O-Rings in Fuels	D. Luning Prak
114	Catherine Thomas	Chemistry	Infrared and Raman Study of CO ₂ Ices on Mars Analog Mineral Surfaces	R. Ferrante
115	Hannah Ortiz	Chemistry	Enzymatic Synthesis of Mycobacterial L,D Transpeptidase Substrates	L. Basta
116	Luke Barrante	Chemistry	Characterization of Vanadium-Oxygen Precursors for the Synthesis of Multi-Metal Oxide Nanocrystals	M. Buck
117	Henry Greene	Chemistry	Eliminating Aberrant RNAs that Appear During <i>In Vitro</i> Selection	D. Morse

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118	Bronte Bacchetta	Chemistry	Degradable Thermoset Polymers from Substituted Dioxepine Monomers	J. Pribyl Ham
119	Pippin Robison ^{T,B}	Chemistry	Investigating the Photodegradation Mechanisms of Chlorpyrifos in Arctic Lacustrine Systems	J. Guerard
120	Maya Solis	Political Science	Microreactor Deployment Technology & Policy	S. Blair
121	Ryan Poggenpohl	History Honors	Tribal Insurgency and Communist Rebellion: CIDG and the Rise of FULRO during the Vietnam War	R. Ruth
122	Ansley Green	History Honors	Communism's Sociological Failures in the Soviet Union: Where Emile Durkheim's Analysis of Religion Diverges with Soviet Civil Religion and Where Durkheim and the Soviet System can be Compared	D. Wheeler
123	Grace Conlin	History Honors	Ramadi Awakening: Instincts of the Marines and Agency of the Tribes	W. Hsieh
124	J. R. Paskach, C. J. Routen, L. J. Fratianne, H. T. Tidball	Energy Analysis, Policy and Security: Beyond Fossil Fuels	Beyond Fossil Fuels – Steel and Iron Manufacturing	K. Swope, P. Caton, J. Smith
125	Prickett, Bamanabio, Moussa, Abraham	Energy Analysis, Policy and Security: Beyond Fossil Fuels	Beyond Fossil Fuels - Maritime Shipping	K. Swope, P. Caton, J. Smith
126	K. Halbert, K. Honig, B. Volontiya	Energy Analysis, Policy and Security: Beyond Fossil Fuels	Beyond Fossil Fuels – Residential Space Heating	K. Swope, P. Caton, J. Smith
127	John Bowers, Cailin Duffy, Jim Selby, Connor Banerjee	Energy Analysis, Policy and Security: Beyond Fossil Fuels	Beyond Fossil Fuels – Chemical, Petrochemical, and Plastics Manufacturing	K. Swope, P. Caton, J. Smith
128	J. Carminati, M. Gephart, C. Altonen, R. Castaneda	Energy Analysis, Policy and Security: Beyond Fossil Fuels	Beyond Fossil Fuels – Cement Production	K. Swope, P. Caton, J. Smith
129	Kathleen McCusker, Deondrae Williams, Giovanni Gambatese	Energy Analysis, Policy and Security: Beyond Fossil Fuels	Beyond Fossil Fuels – Commercial Water Heating	K. Swope, P. Caton, J. Smith
130	H. C. Hicks, S. I. Masuoka, D. H. Taylor	Energy Analysis, Policy and Security: Beyond Fossil Fuels	Beyond Fossil Fuels – Ground Shipping	K. Swope, P. Caton, J. Smith
131	Stonhill, Canalichio, Jordan	Energy Analysis, Policy and Security: Beyond Fossil Fuels	Beyond Fossil Fuels – Aviation	K. Swope, P. Caton, J. Smith

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132	B.H. Groess, A.C. Shevchuk, K.R. Stork	Energy Analysis, Policy and Security: Beyond Fossil Fuels	Beyond Fossil Fuels – Residential Water Heating	K. Swope, P. Caton, J. Smith
133	B. J. Diny, A. R. Nielson, L. S. Pound	Energy Analysis, Policy and Security: Beyond Fossil Fuels	Beyond Fossil Fuels – Commercial Space Heating	K. Swope, P. Caton, J. Smith
134	Richard C. Hansen, Collin M. Henderson, Gabriella E. Leonard	Energy Analysis, Policy and Security: Beyond Fossil Fuels	Beyond Fossil Fuels – Rail Shipping and Transport	K. Swope, P. Caton, J. Smith
135	H.E. Feldmann, D.J. Jordon, A.K. Schofield	Energy Analysis, Policy and Security: Beyond Fossil Fuels	Beyond Fossil Fuels – Food Processing and Production	K. Swope, P. Caton, J. Smith
136	S.P. Ryser, D.J. Carrillo, Z.J. Grant	Energy Analysis, Policy and Security: Beyond Fossil Fuels	Beyond Fossil Fuels – Personal Ground Transportation	K. Swope, P. Caton, J. Smith
	Late Posters			

T = Trident Scholar
B = Bowman Scholar

Note: Many of these projects are on-going and will be continued in the spring semester.
A few posters will not have midshipman presenters (due to conflicts with exams).

More information about midshipman research can be found at:
<http://www.usna.edu/AcResearch/MidResearch/>

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