

HOSTED BY THE USNA RESEARCH OFFICE

# Fall Midshipman Research Poster Session



**U.S. Naval Academy  
Dahlgren Hall  
15 December 2015**

- 0830-0845      Open poster viewing  
Mids should walk around and view the posters. Talk to classmates about research. View the research topics in other departments.  
Guests can view posters.
- 0845-1000      All mids must stand by their posters to discuss their research with faculty and guests.

These midshipmen are enrolled in independent research courses (XX495 or the equivalent, 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.

<b>POSTER #</b>	<b>MIDN Presenter(s)</b>	<b>Major</b>	<b>Poster Title</b>	<b>Adviser(s)</b>
1	Mitchell Heaton <sup>B</sup>	Aeronautical Engineering	Randomized Path Optimization for Mitigated Counter-Detection of UAVs	L. DeVries, M. Kutzer
2	Jim Catina <sup>B</sup>	Aerospace Engineering	Use of Additive Manufacturing to Develop Advanced Hybrid Rock Fuel Grains	K. Castonguay
3	Patrick Negus	Aerospace Engineering	"Sticktion" - The Effect of Static Friction on Attitude Control	J. King
4	Dale Lescher	Aerospace Engineering	Analysis of Flow Characteristics of the USNA Rotor Hover Test Facility	S. Davids
5	Benjamin Branson	Aerospace Engineering	Building and testing rotorcraft facilities to solve the problem of brownout through a centrifugal pumping blade design	J. Milluzzo
6	Edward Hanlon, Morgan Lange, Benjamin Keegan	Aerospace Engineering, Systems Engineering	Autonomous Mobile On-orbit Diagnostic System (AMODS) Program Summary	J. Kang
7	Edward Hanlon, Morgan Lange, Benjamin Keegan	Aerospace Engineering, Systems Engineering	RSat: Component Qualification Test Results	J. Kang
8	Allyson Strachan	Systems Engineering	Enabling Use of Touchscreens: A Practical Design Revision for 3D Printed Upper Limb Prosthetics	M. Kutzer
9	Aaron Sims <sup>T, B</sup>	Systems Engineering	Communication Dependent Control of Multi-Vehicle Formations	L. DeVries, C. Leidig
10	Christina Lanier	Systems Engineering	Helping Kids Run Wild: A Low-Cost Collision Avoidance System in Adapted Ride-on Vehicles for Infants with Mobility Limitations	M. Kutzer
11	Frank Love <sup>B</sup>	Systems Engineering	Trust-Based Consensus to Mitigate False-Data Injections in Networked Sensor Systems	T. Severson
12	Archie Bass, Rebecca Richmond	Systems Engineering	Validation of Theoretical Drag Modeling on a Shape-Adapting Underwater Vehicle	L. DeVries
13	Karah Brown	Systems Engineering	Enhanced State Estimation of Articulated Mechanisms using Auxiliary Sensors	M. Kutzer
14	Alvin Abes <sup>T</sup>	Systems Engineering	Predictive Control of the Cobelli Model for Diabetes Treatment	R. O'Brien
15	Sungbok Lee	Systems Engineering	Bayesian Inference Against Attacks of Deception in Cyber Physical Systems	K. Kiriakidis
16	Forrest Cooke <sup>T</sup>	Systems Engineering	Uncalibrated Three Dimensional Microrobot Control	S. Firebaugh, J. Piepmeier, H. Elbidweihy
17	Rebecca Greenberg <sup>B</sup>	Systems Engineering	Automated Scene Generation for Robotics Simulation using V-REP and Matlab	J. Dawkins
18	John Davis	Systems Engineering	Fiducial Based Augmented Reality for Aircraft Maintenance	B. Bishop
19	Dan Dawson	Systems Engineering	Controlling Directed Energy Through Turbulence	R. O'Brien
20	Tyler McCarthy <sup>B</sup>	Systems Engineering	Improving Gesture Classification Accuracy	L. DeVries
21	Connor Westrick <sup>B</sup>	Systems Engineering	Coverage and Exploration Control of Multiple Vehicles for Radiological Surveys	J. Dawkins
22	Ellen Bradford <sup>B</sup>	Systems Engineering	Modeling and Control of a Micro Autonomous Surface Vessel	B. Bishop
23	Ryan McDonnell	Systems Engineering	Off-Axis Pointing Control for a Joint-Actuated Buoy	O. Thorp, G. Piper
24	Paul Balleza	Systems Engineering	Micro Aerial Vehicle Flight Planning through Hand Motion	R. Broussard
25	Aldrin Racelis	Systems Engineering	Modeling and Control of the Cobelli Model for Diabetes Treatment	R. O'Brien
26	Jacob Dodge	Systems Engineering	Power Parking	B. Bishop
27	Travis Williams	Systems Engineering	Exploring the Transition Phase from Vertical to Forward Flight of a Quad Tilt-Rotor Aircraft	G. Piper

POSTER #	MIDN Presenter(s)	Major	Poster Title	Adviser(s)
28	Taylor Turchan	Systems Engineering	Systematic Surveillance and Detection System	S. Avramov-Zamurovic
29	Kevin Strotz	Systems Engineering	A Linkable Network of Single Actuator Robots	E. Rodriguez-Seda
30	Audrey Head	Chemistry	Spatially Controlled Modification and Functionalization of Natural Polymer Substrates	P. Trulove, E. Fox
31	Michael Dorsey	Chemistry	Investigation the role of mutant beta-amyloid peptide interaction with lipid membranes by means of colorimetric vesicle assay	E. Yates
32	Bridget Lee	Chemistry	Development of 2-Component Surrogate Mixtures for Hydrodepolymerized Cellulosic Diesel (HDCD) Fuel	D. Luning Prak
33	Morgan O'Connor, Eleanor Derouin	Chemistry	Smart Hydrogels for Organophosphorus Nerve Agent Detection	C. Whitaker
34	Alexis Gamarra	Chemistry	Density Functional study of Association Reaction of Iron and Nitric Oxide	R. McClean
35	Ashley Paek	Chemistry	Does Exposure to Nanoparticles Alter the Resistance of Bacteria to Antibiotics and Heavy Metals?	V. Smith
36	Herman Pfaeffle	Chemistry	In Vitro Selection of Hypoxanthine Probe	D. Morse
37	Paris Bess	Chemistry	Computational Analysis of the Reaction of Manganese with Nitric Oxide Gas	R. McClean
38	Tyler Roach	Chemistry	Identification of Inhibitors of Cytochrome P450 (CYP) 1B1	L. Kennedy
39	Alexis Clark, Marlene Perez	Chemistry	Identification and Quantification of Explosives in Soil and Water Samples Using MECK-UV	C. Copper
40	Brice Clairmont	Chemistry	Microwave-Assisted Copper-Catalyzed Amidation of Aryl Halides via Concurrent Tandem Catalysis	S. Lin, A. MacArthur
41	Matthew Worosz	Chemistry	Electrochemical Behavior of Cysteine	G. Cheek
42	Wesley Yuan	Chemistry	Chiral Inversion of Alanine by UV Circular Polarized Light	P. Krieger
43	Tasha Eisenhower	Chemistry	Gender Inequality in STEM Academia: An Investigation of Factors that Influence the Decision to Remain in the Pipeline	M. Teichert
44	Stephanie Moore	Chemistry	Techniques for Teaching Absorption Spectroscopy	M. Teichert, M. Schroeder
45	Chris Lewis, Richard Nguyen	Chemistry	Integrating Research on Student Understanding of Protein Structure with Implementation of a Biochemistry Laboratory Experiment	J. Schlessman, M. Teichert
46	Joseph Francisco, Nia Chandler	Chemistry	Integration of HPLC/MS in Identification of Compounds in Leaf Extracts	D. Dillner, B. Rehill
47	Thomas Toohig	Chemistry	Fe(t-Bu)8TATAP: A Biomimetic Carbon Monoxide Sensor	J. Fitzgerald
48	Adam Hammer	Chemistry	Effects of Red Oak Foliar Phenolic Compounds on the Growth of Gypsy Moth Larvae	B. Rehill
49	Ian McKenzie, Vianey Gomez	Chemistry	Thinking Green: Development of Plant Gene Transformation Laboratories for Midshipmen	B. Rehill
50	Micah Gustafson	Chemistry	Molecular Dynamics: An Introductory Study into the Methodology Behind Computer Aided Atomic Calculations	J. Harrison
51	Onanong Smith	Chemistry	Analysis of Human Cytoplasmic Aconitase by Electron Paramagnetic Resonance Spectroscopy	V. Smith
52	Brandon Foster, Mitch Larios	Chemistry	Investigation of the Effects of Titanium Dioxide Nanoparticles on Liposomes Using Fluorescent Dye Leakage	V. Smith
53	Thomas Moore	Chemistry	Synthesis of Historical Organic Pigments	J. Lomax
54	Samuel J Brad <sup>B</sup>	Chemistry	Improvements in Lipid Yield and Analysis for Algal Biofuels	C. Sweet

<b>POSTER #</b>	<b>MIDN Presenter(s)</b>	<b>Major</b>	<b>Poster Title</b>	<b>Adviser(s)</b>
55	Jess Laney	Chemistry	Tailored Transport and Sequestration via Synthetic Biology	L. Kennedy
56	Nic Butler, Emily Kilen	Chemistry, Physics	Engineering a metal ion binding switch into the interior of a protein	J. Schlessman
57	Michael Woulfe <sup>T</sup>	Physics	The Role of Interactions in Bose-Einstein Condensation	R. Wilson
58	Ryan Burmeister <sup>T</sup>	Computer Science	Smart Neural Network Weight Initialization with Kernel Approximations	G. Taylor
59	Stephen da Cruz, Peter Goutzounis	Computer Science	Resolving Entity Mentions in a Cyberattack	N. Chambers
60	Justin Maguire	Computer Science	Methods and Demographics in Collecting Android's Graphical Pattern Unlock Passwords	A. Aviv
61	Benjamin Fry	Computer Science	Live Detection of Network Attacks Using Social Media	N. Chambers
62	Blair Mason	Computer Science	Hiding Access Patterns in the Cloud	D. Roche
63	A. Whitman Groves	Computer Science	Implementing Sparse Polynomials in the FLINT Library	D. Roche
64	James McMasters <sup>B</sup>	Computer Science, Computer Engineering	Live Detection of Cyber Security Attacks Using Social Media	N. Chambers
65	Jordan DiPaola	Cyber Operations	Tactical Quick Response (QR) Codes and FLIR	T. Robertson
66	Nicholas Co	Cyber Operations	Accelerometer Data Tracking Signatures	T. Robertson
67	Richard Logazino	Cyber Operations	Tactical Adaptations of the Lily Drone	T. Robertson
68	Zac Dannelly, Dave Silver	Cyber Operations, Ocean Engineering	Feasibility of an Offshore Data Center Powered by Renewable Resources	S. Mouring, B. Connett, J. Kosseff
69	Reed Carter	Electrical Engineering	Coil Gun Design Project	D. Opila
70	Allison Hunt <sup>B</sup>	Electrical Engineering	Simulation and Modeling of the CeSAR Positioning System	J. Roth, O. Walker, J. Blanco
71	Kathleen Heinbach	Electrical Engineering	Analyzing Low Probability of Intercept Radar using the Nyquist Folding Receiver	T. Tedesso
72	Spencer Shabshab <sup>T</sup>	Electrical Engineering	Synchronization of Parallel-Connected Three-Phase Power Inverters Through Virtual Oscillator Control (VOC)	D. Opila, J. Stevens
73	Thomas Hand	Electrical Engineering	Directed Energy Detection Using Embedded Fiber Bragg Grating Sensors	B. Jenkins, D. Mechtel, P. Joyce
74	Marius Bernotas	Electrical Engineering	Probability Density Function Analysis for Optimization of Underwater Optical Communications Systems	C. Nelson
75	Jennifer Coletta	Mechanical Engineering	Influence of Notch and Pre-Crack Preparation on Hydrogen Assisted Cracking using the Rising Step Load Test	S. Graham, M. Koul
76	Mark Schnabel <sup>B</sup>	Mechanical Engineering	Lattice-Boltzmann Modeling of Turbine Tip Gap Leakage	R. Volino, S. Blair
77	Max Wiechec <sup>B</sup>	Mechanical Engineering	Scanning Electron Microscopy of Laser Heated HY80 Steel	B. Baker

<b>POSTER #</b>	<b>MIDN Presenter(s)</b>	<b>Major</b>	<b>Poster Title</b>	<b>Adviser(s)</b>
78	Megan Rausch <sup>B</sup>	Mechanical Engineering	Material Characterization of Current Reactor Steels in Advanced Reactor Designs.	B. Baker
79	Maurice Harris	Mechanical Engineering	Improved Methodology for Calculating Interfacial Thermal Resistance and Uncertainty for Steady-State TIM Testers with Embedded Probes	R. Warzoha, A. Smith
80	Timothy Tracey <sup>T</sup>	Mechanical Engineering	Measurement and Modeling of High Energy Laser (HEL)-Droplet Interactions	C. Brownell, S. Blair
81	Stephen Walsh <sup>B</sup>	Mechanical Engineering	A Spatial and Temporal Characterization of the Background Radiation Environment at the Navy and Marine Corps Memorial Stadium	M. Millett, M. Nelson
82	Michael Romano <sup>B</sup>	Mechanical Engineering	Microscale Energy Harvesting through Nonlinear Discontinuous Bistable Structural Dynamics	J. Radice
83	Megan Hough <sup>B</sup>	Nuclear Engineering	Radiation Detector Design, Spy - Small Portable Gamma Detector	M. Nelson, M. Millett
84	Jacob Glesmann <sup>B</sup>	Nuclear Engineering	Determination of Neutron Protection Factors and MCNP Validation	M. Millett, M. Nelson, A. Decker, R. Prins
85	Rocky Mancini	Nuclear Engineering	The Effect of Seawater Saturation on the Radar Cross-Section of Radar Absorbing Material	M. Cerza
86	David Tauber	Naval Architecture	Investigation of Vertical Accelerations on a Planing Hull with Varying Levels of Freedom in Surge	G. White, C. Judge
87	Gavin Hawbaker	Ocean Engineering	Experimental and Numerical Study on Performance of Ducted Hydrokinetic Turbines with Pre-swirl Stator Blades	A. Gish
88	Julie Jesse	Oceanography	Sea Surface Temperature Response to Three Atlantic Tropical Cyclones (2015)	E. Sanabia
89	Kya McAlister	Oceanography	Sea Surface Temperature Response to Three Pacific Hurricanes (2015)	E. Sanabia
90	Julia McKenna	Oceanography	Creating 3D Point Clouds of the HMS Greenwich Model Ship	P. Guth
91	Jonathan Ng	Economics	Using Katrina to Understand the Effects of Corruption on Growth	K. Smith, M. Miller
92	Jeffrey Martino	Economics	The Effect of Uber on DUI Rates	M. Insler
93	Darren Freedman	Economics	The Political Economy of Big Game Conservation	K. Swope
94	Amanda Assenmacher	Economics	Effect of Political Unity on IMF Loans	A. Rahman
95	Daniel Rose	Economics	Impact of CBA of 2011 on NFL Rookie Contract Performance	J. Karam, M. Insler
96	Adarsh Ghosh	Economics	Cybernomics: The cost of Cyber Regulation on the Defense Industry	A. McQuoid, R. Brady
97	Patrick Eytchison	Economics	Inward vs Outward FDI on Growth	J. Rothert
98	Richard Kuzma	Quantitative Economics	Effect of Higher Education on Inward Sectoral Foreign Investment	K. Smith, A. Rahman
99	Megan Musilli	Mathematics	Genetic Algorithms	W. Withers
100	Ian Shaw <sup>T</sup>	Mathematics	Construction of Rational Maps on the Projective Line with Given Dynamical Structure	A. Ksir, B. Stout
101	Thomas Wester <sup>T</sup>	Applied Mathematics (Honors)	Mathematical Modeling: Immune System Dynamics in the Presence of Cancer and Immunodeficiency in vivo	S. Garcia

POSTER #	MIDN Presenter(s)	Major	Poster Title	Adviser(s)
102	Miguel Nieves <sup>T</sup>	Operations Research	Markov Decision Process model of the Accept/Decline Decision in Liver Transplantation	S. Gentry
103	Sean Reilly	Political Science	Sources of Funding as a Sign of Viability During Civil War: A Case Study of Three Colombian Rebel Groups	J. Lewis
104	C. Baird, D. Desouza, B. McMurrey, D. Deverill	Various	Energy Analysis, Policy, and Security: Argentina	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
105	A. Baker, A. Mcintosh, T. Dunbar, B. Tamburello	Various	Energy Analysis, Policy, and Security: Brazil	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
106	C. Day, Z. Macfarlane, F. Simpson, B. Kolbe	Various	Energy Analysis, Policy, and Security: Japan	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
107	J. Diritto, C. Wade, T. Ma, J. Choung	Various	Energy Analysis, Policy, and Security: Mexico	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
108	C. Chroman, K. Gallagher, T. Sims, J. Seals	Various	Energy Analysis, Policy, and Security: France	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
109	J. Weeden, M. Smaldino, J. Merkel, R. Woods	Various	Energy Analysis, Policy, and Security: South Africa	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
110	Z. Coffman, Graf, D. Freedman, M. Rosenberger, A. Alexander	Various	Energy Analysis, Policy, and Security: Germany	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
111	W. Jones, S. Sawyer, M. Wiechec, J. Swett	Various	Energy Analysis, Policy, and Security: South Korea	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
112	B. Bohanan, T. Lindenhayn, E. McCarty, P. Zengueboucah	Various	Energy Analysis, Policy, and Security: Canada	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
113	G. Enslin, T. Lehrke, H. Chan, J. Grace	Various	Energy Analysis, Policy, and Security: Pakistan	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
114	Z. Brown, K. Murrell, D. Wilson, L. Martinez	Various	Energy Analysis, Policy, and Security: China	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
115	T. Germann, M. Doyle, J. Prince, B. Aronin	Various	Energy Analysis, Policy, and Security: Russia	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
116	C. Lent, D. McCaffrey, L. Stalnaker, A. Pruel	Various	Energy Analysis, Policy, and Security: India	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
117	M. Tupica, S. Wissmann, A. Thomas, N. Bermel	Various	Energy Analysis, Policy, and Security: Iran	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
118	J. Fine, A. Welker, E. Guare, E. Whalen	Various	Energy Analysis, Policy, and Security: Israel	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
119	C. Martin, R. Moody, L. Rocha, J. Lapoint	Various	Energy Analysis, Policy, and Security: Ukraine	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
120	S. Walsh, C. Craig, T. Schopf, T. Townsend	Various	Energy Analysis, Policy, and Security: United Kingdom	P. Caton, H. Ernst, K. Flack, J. Smith, K. Swope
121	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://intranet.usna.edu/AcResearch/MidResearch/index.php>

Generous support for midshipman research has been provided by  
the Office of Naval Research (ONR).

Special Thanks to all supporters of Midshipman Research:

USNA Faculty and Staff

USNA STEM Office

USNA MSC and Nimitz Library

Defense Threat Reduction Agency (DTRA)

Department of Energy (DOE)

Class of '79 Gift Fund

