

Madeline A. Kovaleski

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Education	<p>University of Washington, Seattle, WA Applied and Computational Mathematics M.S. GPA: overall 4.0/4.0; Applied Math-only 4.0/4.0</p> <p>Missouri University of Science & Technology, Rolla, MO Applied Mathematics B.S. Minor: Computer Engineering GPA: overall 3.9/4.0; Applied Math-only 4.0/4.0</p>	<p>Sep 24-Present</p> <p>Aug 21-May 24</p>
Publications	<p>Madeline Kovaleski, Aaron Fuller, Jeffrey Kerley, Brendan J. Alvey, Peter Popescu, Derek Anderson, Andrew Buck, James Keller, Grant Scott, Clare Yang, Ken E. Yasuda, Hollie A. Ryan, "Explosive hazard pre-screener based on simulated data with perfect annotation and imprecisely labeled real data," Proc. SPIE 12116, Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Sensing XXIII, 121160X (30 May 2022); https://doi.org/10.1117/12.2618792</p> <p>Jeffrey Kerley, Aaron Fuller, Madeline Kovaleski, Peter Popescu, Brendan Alvey, Derek T. Anderson, Andrew Buck, James M. Keller, Grant Scott, Clare Yang, Ken E. Yasuda, Hollie A. Ryan, "Procedurally generated simulated datasets for aerial explosive hazard detection," Proc. SPIE 12116, Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Sensing XXIII, 1211611 (30 May 2022); https://doi.org/10.1117/12.2618798</p>	
Presentations	<p><i>Explosive hazard pre-screener based on simulated data with perfect annotation and imprecisely labeled real data</i>. Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Sensing XXIII (SPIE Defense + Commercial Sensing 22).</p>	
Research Experience	<p>LEAPS-MPS: Long-time behavior for nonlinear dispersive equations with Dr. Jason Murphy</p> <ul style="list-style-type: none">• Assisted Dr. Murphy with the visualization of one-dimensional and two-dimensional Schrodinger equations for small-amplitude waves to make inferences about accrued nonlinearities.• Developed and tested a numerical nonlinear solver algorithm using finite difference methods (FDMs) to visualize "cubic" nonlinear cases of a Schrodinger equation: "cubic" referring to a class of nonlinear cases with a cubed unknown term.• Interpreted the behavior of cubic wave equations in spatially localized regions of interest with the intention of exploring additional methods of recovering cubic nonlinear terms.• Sought out feedback and mentorship for scientific computing methods in Python, MATLAB, and Julia, refining skills developed in previous research experience. <p>Mizzou INformation and Data FUsion Laboratory (MINDFUL) with Dr. Derek Anderson</p> <ul style="list-style-type: none">• Contributed to the beginning stages of the project by writing a script to process visual spectrum image validation data in the form of axis-aligned bounding boxes (AABBs) leading to the experiments in (<i>Kovaleski et al.</i>)• Designed and implemented experiments with a U-Net convolutional neural network architecture using image data sets consisting of visual spectrum images simulated in Unreal Engine 5, real visual spectrum image data, and real LiDAR image data for the purpose of supplementing limited real image data in identifying regions of interest.• Determined that supplementing real image datasets with image data simulated and labeled in Unreal Engine 5 with varying levels of image abstraction improves the performance of a U-Net in identifying explosive hazards.• Collaborated with other researchers to develop quantitative and qualitative metrics for the performance of the U-Net on collated image datasets, analyze the results of the U-Net experiments, and write two publications on convolutional neural networks for explosive hazard detection.	<p>Jan 23-May 23</p> <p>Jun 21-Dec 22</p>

Industry Experience	<p>United Launch Alliance Software Engineering Intern</p> <ul style="list-style-type: none"> • Assisted the integrated testing team with the software development objectives required for the first certification mission (CERT-1 on January 8, 2024) of the Vulcan Centaur (VC2S) rocket. • Participated in frequent code reviews, project planning meetings, and general team discussion to facilitate detailed feedback and discussion of outstanding action items. • Presented a high-level overview of the integrated testing architecture and recent changes to the integrated testing process. 	May 23-Jul 23
Other Experience	<p>Introduction to Computer Communication Networks, <i>Student Grader</i> Learning Enhancement Across Disciplines (LEAD), <i>Peer Tutor</i></p>	<p>Jan 24-May 24 Aug 23-Dec 24</p>
Awards	<p>Morton Deutsch Endowed Scholar 2021 -2022 Bright Flight Scholarship 2021 - 2024 Curator's Scholar 2021 - 2024 Dean's List 2022, 2023, 2024</p>	
Community Involvement	<p>Northwest Avalanche Center, <i>Community Volunteer</i> Washington Trails Association, <i>Community Volunteer</i> Missouri Collegiate Math Contest (MCMC), <i>1st Place Team</i> Missouri S&T Climbing Club, <i>President</i> Missouri S&T Spelunking Club, <i>Member</i> Missouri S&T Satellite Team (MSAT), <i>Software Engineering Lead</i> Tau Beta Pi Engineering Honors Fraternity, <i>Member</i></p>	<p>Oct 24 Jul 24 Apr 24 Aug 23-May 24 Dec 23-May 24 Sep 22-May 23 Nov 22-Present</p>
References	<p>Dr. Jason Murphy Assistant Professor of Mathematics at the University of Oregon Email: jamu@uoregon.edu</p> <p>Dr. Derek Anderson Professor of Electrical Engineering and Computer Science at the University of Missouri Email: andersont@missouri.edu</p> <p>Dr. Sahra Sedigh Sarvestani Professor of Computer Engineering at Missouri University of Science & Technology Email: sedighs@mst.edu</p>	