

# Christopher T. Morse

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PROFESSIONAL SUMMARY	Curious and motivated early career professional with specialized knowledge at the intersection of software engineering, machine learning, and robotics. Skilled researcher and presenter with a history of publications and awards. Extends perspective through cross-disciplinary collaboration. Resourceful problem solver with an M.S. in Computer Science, seeking role in robot software and perception.		
SKILLS	Python/C++/SQL – Machine Learning – Robot Perception (LiDAR, Cameras) – SLAM – ROS		
EDUCATION	<b>Master of Science</b> , <i>Computer Science</i> , University of Virginia	Charlottesville, VA	
	GPA: 4.00 / 4.00		May 2023
	<b>Bachelor of Arts</b> , <i>Computer Science</i> , University of Minnesota	Minneapolis, MN	
	GPA: 3.91 / 4.00, <i>Music Minor</i>		May 2021
RESEARCH EXPERIENCE	<b>Research Assistant</b> , <i>Leading Engineering for Safe Software (LESS)</i>	University of Virginia	Aug. 2021 - Dec. 2022
	<ul style="list-style-type: none"><li>Created a novel, highly modular system to infer safety specifications from complex robot data.</li><li>Built a pipeline for robot scene coverage approximation; used OpenCV and PyTorch-based panoptic segmentation to construct and compare rich scene graphs.</li></ul>		
	<b>Research Assistant</b> , <i>Interactive Robotics and Vision Laboratory</i>	University of Minnesota – Twin Cities	Jan. 2020 - Jan. 2021
	<ul style="list-style-type: none"><li>Developed a method for paired diver image generation to enable seamless facial recognition and operation of autonomous underwater vehicles.</li><li>Utilized GAN generative models to enhance diver detection and augment sparse training sets.</li></ul>		
	<b>REU Researcher</b> , <i>Nebraska Intelligent Unmanned Systems (NIMBUS)</i>	University of Nebraska – Lincoln	June 2019 - Aug. 2019
TEACHING EXPERIENCE	<b>Teaching Assistant</b>		
	<i>“Robotics for Software Engineers”</i> , University of Virginia		Aug. 2022 - May 2023
	<i>“Discrete Math”</i> and <i>“Intro. to Programming”</i> , University of Minnesota		Sept. 2018 - Dec. 2019
	<ul style="list-style-type: none"><li>Developed learning materials for software principles, automated testing, robot control, sensing, localization, ROS design. Distributed a robust quadrotor simulator with Docker and Git.</li><li>Designed and led highly engaging laboratory sections and projects for hundreds of students.</li></ul>		
PROJECTS	<b>VAE-Guided Testing Framework for OpenPilot’s Perception System</b>		Spring 2022
	<ul style="list-style-type: none"><li>Designed and trained a VAE in PyTorch for manifold approximation of traffic images.</li><li>Clustered training set images with K-Means and PCA to exploit underrepresented features.</li></ul>		
	<b>Synthetic Data Generation for AUV Detection Enhancement</b>		Summer 2020
SERVICE, HONORS, AND AWARDS	<ul style="list-style-type: none"><li>Trained GAN models to perform image domain transfer for sparse training set augmentation.</li><li>Evaluated approach over several detection metrics, reporting +28% mAP.</li></ul>		
	<ul style="list-style-type: none"><li>Paper Reviewer, IEEE International Conference on Robotics and Automation</li></ul>		Fall 2022
	<ul style="list-style-type: none"><li>UROP Research Award Recipient</li></ul>		Summer 2020
	<ul style="list-style-type: none"><li>2nd Place; University of Nebraska REU Research Competition</li></ul>		Summer 2019
PUBLICATIONS	<b>C. Morse</b> , L. Feng, M. Dwyer, S. Elbaum, “A Framework for the Unsupervised Inference of Relations Between Sensed Object Spatial Distributions and Robot Behaviors.” <i>2023 IEEE International Conference on Robotics and Automation (ICRA)</i> .		
	M. J. Islam, C. Edge, Y. Xiao, P. Luo, M. Mehtaz, <b>C. Morse</b> , S. S. Enan, and J. Sattar, “Semantic Segmentation of Underwater Imagery: Dataset and Benchmark.” <i>2020 IEEE International Conference on Intelligent Robots and Systems (IROS)</i> .		