

# Muchen Sun

CONTACT INFORMATION	Department of Mechanical Engineering, Northwestern University, 2145 Sheridan Road, Evanston, IL 60208	(773) 313-5186 <a href="mailto:muchensun2021@u.northwestern.edu">muchensun2021@u.northwestern.edu</a> <a href="https://muchensun.github.io">https://muchensun.github.io</a>
EDUCATION	<b>Northwestern University</b> Ph.D. in Mechanical Engineering	EVANSTON, IL 2019.9 – Present
	<b>Lanzhou University</b> B.E. in Computer Science and Technology	GANSU, CHINA 2015.9 – 2019.6
PUBLICATION	[1] <b>Sun, Muchen</b> , Francesca Baldini, Peter Trautman, and Todd Murphey. "Move Beyond Trajectories: Distribution Space Coupling for Crowd Navigation." In <i>Robotics: Science and Systems</i> . 2021. [2] <b>Sun, Muchen</b> , Ian Abraham, and Todd Murphey. "Ergodic Coverage for Exploration-Exploitation in Active SLAM." <i>IEEE Robotics and Automation Letters</i> (Submitted).	
RESEARCH EXPERIENCES	<b>Social Robot Navigation</b> Northwestern University, IL • Co-wrote this joint grant between Northwestern University and Honda Research Institute (USA). • Lead research team at Northwestern University to study human-robot interaction in extremely dense environments [1].	2021.9 - Present
	<b>Robotic Active Learning in Uncertainty Environments</b> Northwestern University, IL • Study how motion planning could benefit robots learning unknown environments under noisy sensors. Examples include active exploration for simultaneous localization and mapping (SLAM) [2].	2019.12 - Present
	<b>Swarm Robots</b> Northwestern University, IL • Developed a central monitor with GUI for controlling and communicating with the swarm robots.	2019.10 - 2020.3
	<b>StuPyd: Language For Programming Education</b> Project Website: <a href="https://github.com/StuPyd/stupyd-lang">https://github.com/StuPyd/stupyd-lang</a> Lanzhou University, China • Lead the team to design and implement a programming language for undergraduate programming education.	2018.5 – 2018.11
TALKS & SCIENCE OUTREACH	<b>Distribution Space Coupling for Crowd Navigation</b> <i>Robotics: Science and Systems Spotlight Talk</i> Recording: <a href="https://www.youtube.com/watch?v=nBFC2rLhNlU">https://www.youtube.com/watch?v=nBFC2rLhNlU</a>	Virtual, 2021.6
	<b>Robots as New Drivers: Robot Navigation in Human Crowds</b> <i>Northwestern Research Communication Training Program</i> Recording: <a href="https://www.youtube.com/watch?v=fAuqjoW5e7k">https://www.youtube.com/watch?v=fAuqjoW5e7k</a>	Virtual, 2020.8

OPEN-SOURCED SOFTWARE	<b>Ergodax: Jax-Based Toolbox for Ergodicity-Related Computation</b> Project Website: <a href="https://github.com/MurpheyLab/ergodax">https://github.com/MurpheyLab/ergodax</a>	
	<b>DistNav: Toolbox for Distribution Space-Coupled Crowd Navigation</b> Project Website: <a href="https://github.com/MurpheyLab/DistNav">https://github.com/MurpheyLab/DistNav</a>	
	<b>Joey: Customizable ROS Joystick Driver for Differential-Drive Robots</b> Project Website: <a href="https://github.com/MuchenSun/Joey">https://github.com/MuchenSun/Joey</a>	
	<b>Interactive Tutorial for Gaussian Processes</b> Project Website: <a href="https://github.com/MuchenSun/another_gp_tutorial">https://github.com/MuchenSun/another_gp_tutorial</a>	
TEACHING	2020 Fall	TA for <i>ME314: Machine Dynamics</i> at Northwestern University Held office hours, designed weekly programming assignments, taught two lectures.
LEADERSHIP AND SERVICE	2021 – 2019	Co-founder & President of <i>Northwestern Public Speaking Club</i> ( <a href="https://nupublicspeaking.github.io">https://nupublicspeaking.github.io</a> ).
	2020	Certification in Research Communication Training Program (RCTP) at Northwestern University.
TECHNICAL SKILLS	<b>Programming Languages:</b> Python, C/C++, MATLAB <b>Programming Frameworks:</b> ROS, CUDA, MPI, PCL, OpenCV <b>Other Programming Tools:</b> Make, Git, Docker, ANTLR, L <sup>A</sup> T <sub>E</sub> X	