Xi Yu *(she / her / hers)*

6075 S. Innovation Way West
Mesa, AZ 85212   xyu@asu.edu

RESEARCH INTEREST

Multi-robot systems; Resilient robots; Autonomy in extreme environments

PROFESSIONAL EXPERIENCE

Arizona State University, Tempe, AZ
Assistant Professor   August 2024 - present
School of Manufacturing Systems and Networks

West Virginia University, Morgantown, WV
Assistant Professor   January 2021 - August 2024
Department of Mechanical, Materials and Aerospace Engineering

University of Pennsylvania, Philadelphia, PA
Post-Doctoral Researcher   February 2018 - December 2020
GRASP Lab, Department of Mechanical Engineering and Applied Mechanics

EDUCATION

Boston University, Boston, MA
Ph.D. in Mechanical Engineering   January 2018
M.S. in Mechanical Engineering (claimed before the terminal degree)

Karlsruhe Institute of Technology, Karlsruhe, Germany
Dipl.-Ing. in Mechanical Engineering   October 2011
B.Sc. in Mechanical Engineering   October 2010

GRANT / AWARD

Research Grants

[A5] **NSF** Award OPP-2322057:
      Collaborative Research: Ideas Lab: Meshed Observations of THE Remote Subsurface with
      Heterogeneous Intelligent Platforms (MOTHERSHIP)   2023 - 2026
      Total: $1,499,665 (for six awards), Leading Institute: Oregon State University
      This award's share: $191,734, **PI**: Xi Yu

[A4] **ONR** Award N00014-23-1-2536:
      Dynamic Rendezvous of Under-Actuated Vehicles in Semi-Structured Geophysical Flows
      Total: $390,866, **PI**: Xi Yu   2023 - 2026

[A3] **NASA** Non-Competitive Grant:
      West Virginia University Robotics Laboratories for Education, Research, and Outreach   2024 - 2025
      Total: $1,000,000, PI: Jason Gross, **CoI**: Xi Yu and others, Location: West Virginia University

[A2] **NSF** Award CNS-2348288:
      REU Site: Undergraduate Robotics Research for Rural Appalachia   2024 - 2027
      Total: $454,179, PI: Jason Gross, **Senior Personnel**: Xi Yu and others,
      Location: West Virginia University

[A1] **DOE** Award DE-EE0010849:
      The Development of an Advanced Infrared Hydrogen Fuel Flexible Boiler for Food & Beverage
      Industry   2024 - 2027
      Total: $4,070,000, PI: Hailin Li, **CoI**: Xi Yu and others, Location: West Virginia University

Past Awards

Travel Grant, NSF Robot Learning Workshop, Lehigh University	2019
Teaching as Research Fellowship, Boston University	2015 - 2016
NSF Student Travel Award, the 53th IEEE Conference on Decision and Control	2014
Dean's Fellowship, College of Engineering, Boston University	2012 - 2013
Cheung Family Fellowship, College of Engineering, Boston University	2012 - 2013
Robert Bosch Stiftung (Fellowship), Karlsruhe Institute of Technology	2005 - 2009

TEACHING

Graduate Core Course(s)

(ASU) EGR 501 Applied Linear Algebra for Engineers (Fall 2024)

Undergraduate Core Courses

(WVU) MAE 460 Automatic Control (Fall 2021, Fall 2022, Fall 2023)
(WVU) MAE 102 MAE Design (Spring 2023)
(WVU) MAE 411L Mechatronics Lab (4 sections, Spring 2024)

Graduate/Undergraduate Electives (newly developed)

(WVU) MAE 593C Coordinated Mobile Robots, Graduate Level (Spring 2022)
(WVU) MAE 493B Coordinated Mobile Robots, Undergrad Level (Spring 2024)

MENTORING

Master Students (4):

Austin Sponaugle (WVU), ME Master 2025
Juan David Pabon (WVU), AE Master 2023
Li Shen (UPenn), MEAM Master 2022, *annual winner* of Penn MEAM *Outstanding Research Award*
Peihan Li (UPenn), MEAM Master 2022, *currently Ph.D. candidate at Drexel University*

Undergraduate Research Assistants (14):

* *Placement information* provided if the student acquired a recommendation letter from me.
Class of 2023(WVU):
Kevin Scott Blankenship (ME/AE, *currently AeroE grad student at UMich-Ann Arbor*),
Joshua Caswell (ME/AE, *currently ROBO Master student at UPenn GRASP Lab*),
Zachary Roney (ME/AE), Travis Mueller (CS/Physics), Grant Stumpf (CPE)
Class of 2024(WVU): Kendal McCutcheon (ME/AE), Kevin Lang (ME/AE), Ethan Wright (CS)
Class of 2025(WVU): Christ Smith (ME/AE), Ava Milano (EE), Tucker Wilson (EE)
Class of 2026(WVU): Tryston Freeman (ME), Ryan Jefferies (ME/AE)
Class of 2027(WVU): Aiden Ballard (CS)

PEER REVIEWED PUBLICATION

Journal Articles

[J6] **X. Yu**, D. Saldana, D. Shishika, and M. A. Hsieh, "Resilient consensus in robot swarms with periodic motion and intermittent communication", IEEE Tran. on Robotics (T-RO) 38 (1), pp.110-125. 2021.

[J5] N. Zhou, C. G. Cassandras, **X. Yu**, and S. B. Andersson, "The price of decentralization: event-driven optimization algorithms for multi-agent persistent monitoring tasks", IEEE Tran. on Control of Network Systems (T-CNS) 8 (2), pp. 976-986. 2020.

[J4] **X. Yu** and M. A. Hsieh, "Synthesis of a time-varying communication network by robot teams with information propagation guarantees", IEEE Robotics and Automation Letters (RA-L), 5(2), pp.1413 – 1420, *with presentation* at the International Conference on Robotics and Automation (ICRA), 2020.

[J3] **X. Yu**, M. A. Hsieh, C. Wei and H. G. Tanner, "Synchronous rendezvous for networks of marine robots in large scale ocean monitoring", Frontiers in Robotics and AI 6 (2019): 76. 2019.

[J2] **X. Yu**, S. B. Andersson, N. Zhou, and C. G. Cassandras, "Scheduling multiple agents in a persistent monitoring task using reachability analysis", IEEE Tran. on Automatic Control (T-AC) 65(4), pp.1499-1513. 2019.

[J1] N. Zhou, **X. Yu**, S. B. Andersson, and C. G. Cassandras, "Optimal event-driven multi-agent persistent monitoring of a finite set of data sources", IEEE Tran. on Automatic Control (T-AC) 63(12), pp.4204-4217. 2018.

Conference Proceedings (student advisee underlined)

[C18] T. C. Silva, **X. Yu**, and M. A. Hsieh, "Probabilistic multi-robot planning with temporal tasks and communication constraints." In Distributed Autonomous Robotic Systems (DARS): The 17th International Symposium, 2024.

[C17] J. D. Pabon, M. C. Valenti, and **X. Yu,** "Where to deploy an airborne relay in unknown environments: feasible locations for throughput and los enhancement." In MILCOM 2023-2023 IEEE Military Communications Conference.

[C16] T. C. Silva, L. Shen, **X. Yu**, and M. A. Hsieh, "Receding horizon control on the broadcast of information in stochastic networks." In Distributed Autonomous Robotic Systems (DARS): The 16th International Symposium, 2022.

[C15] J. D. Pabon, S. Alkandari, M. C. Valenti, and **X. Yu,** "Air-aided communication between ground assets in a Poisson Forest." In MILCOM 2022-2022 IEEE Military Communications Conference, pp. 133-139. IEEE, 2022 *(short-listed for the best paper award)*.

[C14] L. Shen, **X. Yu**, and M. A. Hsieh, "Topology control of a periodic time-varying communication network with stochastic temporal links." In 2022 American Control Conference (ACC), pp. 4211-4217. IEEE, 2022.

[C13] G. Knizhnik, P. Li, **X. Yu**, and M. A. Hsieh, "Flow-based control of marine robots in gyre-like environments." In 2022 International Conference on Robotics and Automation (ICRA), pp. 3047-3053. IEEE, 2022.

[C12] **X. Yu**, D. Shishika, D. Saldana and M. A. Hsieh, "Modular robot formation and routing for resilient consensus." In 2020 American Control Conference (ACC), pp. 2464-2471.IEEE, 2020.

[C11] C. Wei, H.G. Tanner, **X. Yu**, and M.A. Hsieh, "Low-range interaction periodic rendezvous along lagrangian coherent structures." In 2019 American Control Conference (ACC), pp. 4012-4017. IEEE, 2019.

[C10] N. Zhou, C. G. Cassandras, **X. Yu**, and S. B. Andersson, "Optimal threshold-based control policies for persistent monitoring on graphs." In 2019 American Control Conference (ACC), pp. 2030-2035. IEEE, 2019.

[C9] C. Wei, **X. Yu***(Primary Author), H.G. Tanner, and M.A. Hsieh, "Synchronous rendezvous for networks of active drifters in gyre flows." In Distributed Autonomous Robotic Systems (DARS): The 14th International Symposium, pp. 413-425. Springer International Publishing, 2019.

[C8] **X. Yu**, S. B. Andersson, N. Zhou, and C. G. Cassandras, "Optimal visiting schedule search for persistent monitoring of a finite set of targets." In 2018 American Control Conference (ACC), pp. 4032-4037. IEEE, 2018.

[C7] N. Zhou, C. G. Cassandras, **X. Yu**, and S. B. Andersson, "Decentralized event-driven algorithms for multi-agent persistent monitoring." In 2017 IEEE 56th Annual Conference on Decision and Control (CDC), pp. 4064-4069. IEEE, 2017.

[C6] **X. Yu**, S. B. Andersson, N. Zhou, and C. G. Cassandras, "Optimal dwell times for persistent monitoring of a finite set of targets." In 2017 American Control Conference (ACC), pp. 5544-5549. IEEE, 2017.

[C5] N. Zhou, C. G. Cassandras, **X. Yu**, and S. B. Andersson, "Optimal event-driven multi-agent persistent monitoring with graph-limited mobility." IFAC-PapersOnLine, 50(1), pp.2181-2186. 2017.

[C4] N. Zhou, **X. Yu**, S. B. Andersson, and C. G. Cassandras, "Optimal event driven multi-agent persistent monitoring of a finite set of targets." In 2016 IEEE 55th Conference on Decision and Control (CDC), pp. 1814-1819. IEEE, 2016.

[C3] **X. Yu** and S. B. Andersson, "Preservation of system properties for networked linear, time invariant control systems in the presence of switching delays." In 2014 IEEE 53rd Conference on Decision and Control, pp. 5260-5265. IEEE, 2014.

[C2] **X. Yu** and S. B. Andersson, "Effect of switching delay on a networked control system." In 2013 IEEE 52nd Conference on Decision and Control, pp. 5945-5950. IEEE, 2013.

[C1] A. Albers**, X. Yu** and H. Sommer, "Effect of initial knowledge on reinforcement learning based control", Conference of Danube Adria Association for Automation & Manufacturing, Vienna, Austria, 2011.

PUBLIC PRESENTATION

[P16] "Recent advancement of indoor light-than-air agents: Coordinating robots in a dynamic world", workshop at IEEE International Conference on Advanced Intelligent Mechatronics (AIM), Boston, MA, July 2024

[P15] "Sailing with the uncertainty: multi-robot systems in a dynamic world", Department of Electrical and Computer Engineering, University of Connecticut, Storrs, CT, March 2024

[P14] "Sailing with the uncertainty: multi-robot systems in a dynamic world", Department of Mechanical Engineering and Mechanics, Lehigh University, Bethlehem, PA, March 2024

[P13] "Sailing with the uncertainty: multi-robot systems in a dynamic world", Institute for Autonomous & Connected Systems, Old Dominion University, Norfolk, VA, March 2024

[P12] "Sailing with the uncertainty: multi-robot systems in a dynamic world", Department of Aerospace Engineering, University of Maryland, College Park, MD, February 2024

[P11] "Sailing with the uncertainty: multi-robot systems in a dynamic world", Walker Department of Mechanical Engineering, The University of Texas at Austin, Austin, TX, February 2024

[P10] "Sailing with the uncertainty: multi-robot systems in a dynamic world", Department of Mechanical, Aerospace, and Biomedical Engineering, University of Tennessee, Knoxville, TN, February 2024

[P9] "Sailing with the uncertainty: multi-robot systems in a dynamic world", School of Manufacturing Systems and Networks, Arizona State University, Tempe, AZ, January 2024

[P8] "Stochastic time-varying networks synthesized by robots in dynamic environments", MAE Robotics Seminar at Ohio State University, Columbus, OH, November 2023

[P7] *(virtual)* "Stochastic time-varying networks synthesized by robots in dynamic environments", ECE Graduate Seminar at Old Dominion University, Norfolk, VA, November 2023

[P6] *(virtual)* "Stochastic time-varying networks synthesized by robots in dynamic environments", ECE Department Seminar at Drexel University, Philadelphia, PA, August 2023

[P5] "Stochastic time-varying networks synthesized by robots in dynamic environments", Baylor University, Waco, TX, June 2023

[P4] "Stochastic time-varying networks synthesized by robots in dynamic environments", CISE Seminar at Boston University, Boston, MA, October 2022

[P3] *(virtual)* "Intermittently connected robotic systems in dynamic environments", Lehigh University, Bethlehem, PA, September 2020

[P2] *(virtual)* "Intermittently connected robotic systems in dynamic environments", Department of Mechanical and Aerospace Engineering, West Virginia University, Morgantown, WV, April 2020

[P1] "Multi-agent persistent monitoring of a finite set of targets", GRASP Special Seminar at the GRASP Lab, University of Pennsylvania, Philadelphia, PA, October 2017. YouTube Source: https://youtu.be/CNbUTUlAypM

PRESS / PUBLICITY

[N6] "WVU engineer part of team aiming to send fleet of marine robots under ocean ice to combat climate change", by John Mark Shaver, on The State Journal (statewide weekly newspaper in WV)

[N5] "Meet the WVU researcher training a swarm of robots to explore deep below oceanic ice", by Jack Walker, on Times West Virginian (daily newspaper in North Central West Virginia)

[N4] "WVU researcher helping to deploy robots underwater", by WDTV News Staff, on WDTV 5 (TV channel, CBS affiliate for the Weston/Clarksburg/Fairmont, WV)

[N3] "WVU researcher to help send swarm of robots beneath ocean ice", by David Sibray, on West Virginia Explorer (local magazine)

[N2] "WVU researcher to help send swarm of marine robots on climate change quest beneath ocean ice", by Katie McDowell, on The Dominian Post (daily newspaper in Morgantown, WV)

[N1] "WVU researcher to help send swarm of marine robots on climate change quest beneath ocean ice", by Micaela Morrissette, *Top Story* on WVUToday (University media)

PROFESSIONAL SERVICE

Academic Societies

Associate Editor

IEEE Robotics and Automation Letters (RA-L)	2021- present
IEEE International Conference on Robotics and Automation (ICRA)	2020

Program Committee

American Control Conference (ACC)	2023
IEEE Military Communications Conference	2023
The ACM/SIGAPP Symposium On Applied Computing	2020 - 2023

Finance Chair

The 3rd IEEE International Symposium on Multi-Robot and Multi-Agent Systems	2021

Session Chair

IEEE International Conference on Robotics and Automation (ICRA)	2022

Reviewer

- Journal Reviews -

IEEE Transaction of Automatic and Control (T-AC), IEEE Transactions on Control of Network Systems (T-CNS), IFAC Automatica, IEEE Transaction on Robotics (T-RO), IEEE Robotics and Automation Letters (RA-L), Autonomous Robots (AURO).

- Conferences -

IEEE Conference on Decision and Control (CDC), IEEE American Control Conference (ACC), IEEE International Conference on Robotics and Automation (ICRA), IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Robotics: Science and Systems (RSS), IFAC World Congress.

West Virginia University, Morgantown, WV

Organizer and mentor of the 'Lighter than Air' Blimps Competition Team	2023 - 2024

Leading a team of 8 undergraduate students to participate in competitions held by George Mason University (Spring 2023, Spring 2024) and Lehigh University (Fall 2023)

Curriculum committee member	2023 - 2024

Robotics B.S. Program, Department of Mechanical and Aerospace Engineering

Ph.D. qualification exam committee member	Fall 2023

Area of Applied Mathematics

Ph.D. thesis committee member for:

James Long (WVU), Mathematics, Ph.D.	*Graduated* 2023
Ryan Gerald McLaughlin (WVU), Aerospace Engineering, Ph.D.	*Graduated* 2023
Bernardo Martinez Rocamora Junior (WVU), Aerospace Engineering Ph.D.	*Graduated* 2023
Jared Joseph Beard (WVU), Aerospace Engineering, Ph.D.	*Graduated* 2024
Clarus Goldsmith (WVU), Mechanical Engineering Ph.D.	*Proposal Defense* 2022
Christopher Arend Tatsch (WVU), Mechanical Engineering Ph.D.	*Proposal Defense* 2024
Rijal Madhav (WVU), Mechanical Engineering, Ph.D.	

MS thesis committee member for:

Dylan Covell (2022), Shaikha Alkandari (2022), Chloe Guie (2023), William Zyhowski (2023), Thomas Clareson (2024), John Little

NSF-funded REU programs mentor 2021 - 2022
   Robotics Research in Human-Swarm Interaction project (12 undergraduate students/year)

University of Pennsylvania, Philadelphia, PA

Volunteer of the Penn Health-Tech Face Shields Rapid Response Team 2020
GRASP Exhibitor at USA Science & Engineering Festival 2018

Boston University, Boston, MA

RISE Mentor for high school students summer research programs 2017
Organizer of department Annual Graduate Student Workshop 2016 - 2017
Student host for department invited seminar speakers 2014 - 2017

Local Communities

Volunteer for Annual North Central West Virginia Girls in Aviation Day, Fairmont, WV 2022 - 2023
Volunteer Judge for Annual Science and Technology Fair, Pioneer Charter School of Science, Everett, MA
2014 – 2017