

Sierra N. Young, Ph.D.

Biological and Agricultural Engineering
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Education

- 2018 Ph.D. Civil Engineering, University of Illinois at Urbana-Champaign
Dissertation: *Human-Robot Interaction for Telemanipulation by Small Unmanned Aerial Systems*
(Chair: Joshua M. Peschel)
- 2015 M.S. Civil Engineering, University of Illinois at Urbana-Champaign
- 2014 B.S. Civil and Environmental Engineering, Cornell University

Academic Appointments

- 2019 Assistant Professor of Biological and Agricultural Engineering
North Carolina State University
- 2017-2018 Visiting Scholar of Agricultural and Biosystems Engineering
Iowa State University

Publications

REFEREED JOURNAL ARTICLES

- 7. S. N. Young, R. Lanciloti, and J. M. Peschel. (2020) "Human-Robot Interfacing for Performing Telemanipulation Tasks Using Small Unmanned Aerial Systems." *Journal of Human-Robot Interaction*, in review.
- 6. G. Penny, V. Srinivasan, Apoorva R., J. M. Peschel, S. N. Young, and S. E. Thompson. (2020) "A Process-Based Hydrologic Reconstruction to Understand Streamflow Decline in a Human-Dominated Semiarid Catchment." *Hydrological Processes*, doi:10.1002/hyp.13707.
- 5. S. N. Young and J. M. Peschel. (2020) "Review of Human-Machine Interfaces for Small Unmanned Systems with Robotic Manipulators." *IEEE Transactions on Human-Machine Systems*, doi:10.1109/THMS.2020.2969380.
- 4. S. N. Young. (2019) "A Framework for Evaluating Field-Based, High-Throughput Phenotyping Systems: A Meta-Analysis." *Sensors*, 19, 3582, *IEEE Transactions on Human-Machine Systems*, doi:10.3390/s19163582.
- 3. S. N. Young, J. M. Peschel, and E. Kayacan. (2018) "Design and Field Evaluation of a Ground Robot for High-Throughput Phenotyping of Energy Sorghum." *Precision Agriculture*, 1-26. doi:10.1007/s11119-018-9601-6.
- 2. Erkan Kayacan, S. N. Young, J. Peschel, and G. Chowdhary. (2018) "High Precision Control of Tracked Field Robots in the Presence of Unknown Traction Coefficients." *Journal of Field Robotics*,

1-13. doi.org/10.1002/rob.21794.

1. S. N. Young, J. M. Peschel, G. Penny, S. Thompson, and V. Srinivasan. (2017) "Robot-Assisted Measurement for Hydrologic Understanding in Data Sparse Regions." *Water*, 9(7). doi:10.3390/w9070494.

Awards and Fellowships

2020	New Faces of ASABE Class of 2020 Top Honoree, ASABE
2018	Global Water Security for Agriculture and Natural Resources Conference Travel Award, ASABE
2018	Graduate College Travel Award, University of Illinois at Urbana-Champaign
2017	Springer Best Oral Presentation Award, Innovative Strategies for Sustainable Water Management
2016	National Defense Science and Engineering Graduate Fellowship, U.S. Department of Defense
2016	FMC Educational Fund Fellowship, FMC Technologies, University of Illinois at Urbana-Champaign

Invited Talks and Seminars

9. "From Farm to Takeoff: Small Unmanned Robots for Agricultural and Biological Systems." Invited Seminar Speaker, Cornell Initiative for Digital Agriculture (CIDA) Seminar Series, December 9, 2019, Ithaca, NY, USA.
8. "Using Robotics and Automation to Improve the Throughput of Field-Based Phenotyping." Invited Seminar Speaker, Syngenta RTP Plant Expression Community Seminar Series, November 12, 2019, Raleigh, NC, USA.
7. "From Farm to Takeoff: Ground and Aerial Robots for Biological Systems Analysis." Invited Seminar Speaker, Carnegie Mellon University Field Robotics Center Seminar Series, May 21, 2019, Pittsburgh, PA, USA.
6. "Advancements and Challenges in Technology and Data Management Practices of Field-Based, High-Throughput Phenotyping." *Phenome 2019* Invited Speaker, American Society of Plant Biologists, February 6-9, 2019, Tucson, AZ, USA.
5. "Unmanned Systems for Sensing and Sense-Making in Agricultural and Natural Environments." Invited Seminar Speaker, Department of Food, Agricultural and Biological Engineering, The Ohio State University, April 10, 2018, Columbus, OH, USA.
4. "Human-Machine Interaction in Robotics and Automation for Sensing and Sense-Making." Invited Seminar Speaker, Department of Agricultural and Biosystems Engineering, Purdue University, February 26, 2018, West Lafayette, IN, USA.
3. "Design and Evaluation of a Ground Vehicle for Field-Based Phenotyping of Energy Sorghum." *Phenome 2018* Invited Speaker, American Society of Plant Biologists, February 14-17, 2018, Tucson, AZ, USA.

2. “Robot-Assisted Measurements in a Data-Sparse Region of India.” Invited Seminar Speaker, Ven Te Chow Hydrosystems Seminar, University of Illinois, Urbana, IL, USA, April 15, 2016.
1. “Bathymetric Data Collection Using Multiple Robotics Platforms: UAVs, USVs, and Kite Aerial Photography.” Invited Speaker, Linking Robotics, Citizen Science and Remote Sensing to Advance Water Science in Data-Scarce Regions Seminar, Ashoka Trust for Research in Ecology and the Environment (ATREE), Bangalore, Karnataka, India, June 12, 2015.

Presentations

CONFERENCE PRESENTATIONS AND POSTERS

11. S. N. Young and J. M. Peschel. (2019) “Advancing Remote Manipulation with Unmanned Aerial Vehicles for Agricultural Applications.” ASABE Annual International Meeting, July 9, 2019, Boston, MA, USA. (poster)
10. S. N. Young, R. Lanciloti, and J. M. Peschel. (2018) “Unmanned Systems for Agricultural Water Measurement and Management.” Global Water Security for Agricultural and Natural Resources (ASABE Global Initiative Conference), October 3–6, 2018, Hyderabad, India. (oral)
9. S. N. Young, K. Koppula, R. Lanciloti, J. Riesen, and J. M. Peschel. (2018) “Telemanipulation by Unmanned Aerial Vehicles for Agricultural Data Applications.” American Society of Agricultural and Biological Engineers (ASABE) International Meeting, July 29–August 1, 2018, Detroit, MI, USA. (oral)
8. S. N. Young, J. Riesen, and J. M. Peschel. (2018) “In Situ Measurement of Soil-Water Parameters using a Micro Unmanned Aerial Vehicle.” *World Environmental and Water Resources Congress*, American Society of Civil Engineers, June 3–7, 2018, Minneapolis, MN USA. (oral)
7. J. M. Peschel and S. N. Young. (2017) “Human-Robot Teaming for Hydrologic Data Gathering at Multiple Scales.” American Geophysical Union Fall Meeting, December 11–17, 2017, New Orleans, LA, USA. (oral)
6. S. N. Young. (2017) “Field Application of Small, Low-Cost Robots for Remote Surface Data Collection.” *Innovative Strategies for Sustainable Water Management*, November 17–18, 2017, Phagwara, Punjab, India. ****Best Oral Presentation and Springer Abstract Award.***
5. J. M. Peschel and S. N. Young. (2016) “Robot-Assisted Socio-Hydrologic and Water Quality Understanding in Data Sparse Regions.” American Geophysical Union Fall Meeting, December 12–16, 2016, San Francisco, CA, USA. (poster)
4. S. N. Young and J. M. Peschel. (2016) “Bathymetric Mapping with a Small Unmanned Surface System.” *World Environmental and Water Resources Congress*, American Society of Civil Engineers, May 22–26, 2016, West Palm Beach, FL, USA. (poster)
3. S. N. Young and J. M. Peschel. (2015) “Waterway-View Imaging with a Small Unmanned Surface System.” American Geophysical Union Fall Meeting, December 14–18, 2015, San Francisco, CA, USA. (poster)
- 2.

J. Peschel, S. N. **Young**, G. Penny, S. Thompson, and V. Srinivasan. (2015) “Robot-Assisted Measurements in Data Sparse Regions.” American Geophysical Union Fall Meeting, December 14–18, 2015, San Francisco, CA, USA. (oral)

1. G. Penny, S. E. Thompson, V. Srinivasan, J. M. Peschel, and S. N. **Young**. (2015) “Streamflow Generation in a Drying Catchment Outside Bangalore, India.” American Geophysical Union Fall Meeting, December 14–18, 2015, San Francisco, CA, USA. (poster)

EXTENSION PRESENTATIONS

3. S. N. **Young**. “Current and Future Uses for Ground and Aerial Robots in Fruits and Vegetables: Peach, Strawberry, and Black/Raspberry.” Southeast Regional Fruit & Vegetable Conference, January 10, 2020, Savannah, GA.
2. S. N. **Young**, C. Reberg-Horton, J. Ward, and G. Roberson. “Digital Ag Tools for On-Farm Research.” NC Extension Conference, October 28, 2019, Raleigh, NC.
1. S. N. **Young** and J. Ward. “Tools for Phenotyping, Precision Agriculture, and Machine Systems.” International Union of Forest Research Organizations Tree Biotechnology Conference, June 26, 2019, Raleigh, NC.

INTERNAL CAMPUS PRESENTATIONS

5. “Design and Control of Small Manipulators for Unmanned Aerial Vehicles (UAVs).” (2018) A. Vande Loo, B. Burright, J. Early, J. Lacoma, J. Wilkinson, S. N. **Young**, and J. Peschel. Iowa State University Research Day, April 25, 2018, Ames IA, USA.
4. “Water Measurement System for Unmanned Surface Vehicles.” (2018) R. Lanciloti, N. Brady, D. Berbrich, D. Myers, S. N. **Young**, and J. Peschel. Iowa State University Research Day, April 25, 2018, Ames IA, USA.
3. “Unmanned Aerial Vehicle Interface Development.” (2018) S. Hassebroek, J. Peterson, A. Rosenhamer, S. N. **Young**, and J. Peschel. Iowa State University Research Day, April 25, 2018, Ames IA, USA.
2. “Design of a Soil Sampling Mechanism for Unmanned Aerial Vehicles.” (2018) R. Steiner, J. Riesen, S. N. **Young**, and J. Peschel. Iowa State University Research Day, April 25, 2018, Ames IA, USA.
1. “Robot-Assisted Hydrologic Measurements in Data Sparse Regions.” (2016) S. N. **Young**, and J. Peschel. Illinois Water Day, April 8, 2016, Urbana, IL, USA.

Mentorship and Instruction

CURRENT POST-DOCTORAL RESEARCH ASSOCIATES

Dr. Yuzhen Lu; December 2019 - Present

CURRENT PH.D. STUDENTS

Piyush Pandey (co-advised); anticipated graduation: May 2022

Hemanth Dakshinamurthy; anticipate graduation: May 2022

CURRENT M.S. THESIS STUDENTS

Anh Nguyen; anticipated graduation: May 2021
Russell Smith (co-advised); anticipated graduation: May 2021
Andrew Hillman (co-advised); anticipated graduation: May 2021

UNDERGRADUATE STUDENTS SUPERVISED

Brie Saur, Angela Gutierrez, Esmira Poladova, Karen Sloan; Spring 2020
Project Title: Water Sampling Payload for an Autonomous Surface Vehicle (Senior Design Project)

Evan Smith; Summer 2019 - Present
Project Title: Development of an Automated Conveyor System for Greenhouse Hyperspectral Imaging

William Daniels; Summer 2019
Project Title: Wireless Long-Range Sensors for Monitoring SweetPotatoes

Nicole Knox; Spring-Fall 2019
Project Title: Stereo Imaging for Underwater Plant Systems

TEACHING EXPERIENCE

- Since 2019 Instructor, North Carolina State University, *BAE 401/501 Sensors and Controls*
Lecture and lab-based course for undergraduate and graduate students serving as an introduction for two- and three-dimensional visual sensing for automated sensemaking in agricultural, natural, and urban systems. Focuses on understanding both the theory and hands-on aspects of computer vision.
- Spring 2018 Co-Instructor, Iowa State University, *ABE 690 Visual Sensing and Sensemaking*
Lecture and lab-based course for graduate students serving as an introduction for two- and three-dimensional visual sensing for automated sensemaking in agricultural, natural, and urban systems. Focuses on understanding both the theory and hands-on aspects of computer vision.
- Spring 2018 Co-Instructor, Iowa State University, *HON 290H Honors Program*
Independent study research-based course on topics of an interdisciplinary nature. Provides an introduction to research methodology and hands-on experience in a robotics and sensing lab. Intended for freshmen and sophomores with membership in the University Honors Program.

WORKSHOPS

“Future Directions: Robotic Applications for Ag Sensing”. Instructor, Data Science for Ag Extension Agents Workshop, Booth Field Learning Lab, January 16, 2019, Raleigh, NC.

“Hardware and Sensors.” Instructor and Organizer, Phenome Digital Phenotyping Workshop, Phenome 2018 and 2019, Tucson, AZ.

“Unmanned Aerial Vehicles in Intensively Managed Landscapes.” Instructor, Consortium of Universities for the Advancement of Hydrologic Science (CUAHSI), Role of Runoff and Erosion on Soil Carbon Stocks Workshop, Purdue University, October 20-21, 2015, West Lafayette, IN.

Service to the Profession

APPOINTED OR ELECTED LEADERSHIP

since 2019	Vice Chair, Emerging Information Systems (ITSC-254) Committee, ASABE, Boston, MA
since 2019	Secretary, Emerging and Innovative Technologies Committee, ASCE EWRI, Pittsburgh, PA
2019	Program Committee, Phenome 2019 Conference, American Society of Plant Biologists, Tucson, AZ
2016-2018	Director and Liaison, Graduate Women in the Society of Women Engineers, University of Illinois at Urbana-Champaign

COMMITTEE MEMBERSHIP INVOLVEMENT

since 2018	Technical Committee on Agricultural Robotics and Automation, IEEE RAS
since 2018	Emerging and Innovative Technologies Committee, ASCE EWRI
since 2018	Emerging Information Systems Committee (ITSC-254), ASABE
2018-2019	Unmanned Systems for Environmental and Water Resources Task Committee, ASCE EWRI

MEMBERSHIP IN PROFESSIONAL AND HONORARY SOCIETIES

since 2017	American Society of Agricultural and Biological Engineers
since 2017	Institute of Electrical and Electronics Engineers
since 2015	American Geophysical Union
since 2014	National Honor Society Tau Beta Pi
since 2013	National Honor Society Chi Epsilon
since 2013	Society of Women Engineers
since 2012	American Society of Civil Engineers

EDITORSHIPS AND REVIEWING ACTIVITIES

2020	Guest Editor, Plant Phenomics and Precision Agriculture Call for Papers, <i>PLOS One</i> .
Ongoing	Reviewer, <i>Transactions of the ASABE</i> , <i>Applied Engineering in Agriculture</i> , <i>Plant Methods</i> , <i>HardwareX</i> , <i>Hydrological Sciences</i> , <i>Frontiers in Earth Science</i> .

Departmental and University Service

NC STATE CAMPUS SERVICE

2019	Volunteer, VEX Robotics Triangle League Competitions
2019	Volunteer, BAE Ecological Engineering Summer Camp
2019	Volunteer, ASABE Rally in Raleigh Panel Moderator

UNIVERSITY OF ILLINOIS CAMPUS SERVICE

2015-2018	Committee Member, Graduate Women in the Society of Women Engineers
2015-2017	Organizer and Volunteer, Women Exploring Graduate Opportunities in CEE
2017	Committee Member, Women Empowered in STEM Conference (weSTEM) Organizing Committee
2016	Organizer and Volunteer, Girls' Adventures in Mathematics, Engineering, and Science Camp
2016	Organizer and Volunteer, Booker T. Washington Elementary School STEM Academy
2015-2016	Volunteer, Nanoscale Science and Technology Resources for Community Teaching
2014-2016	Volunteer, University of Illinois Engineering Open House

COMMUNITY OUTREACH AND INVOLVEMENT

PUBLIC LECTURES

2. “Blow-Up and Robot Stories.” PechaKucha Night Champaign-Urbana, Volume 23, February 11, 2017, Urbana, IL, USA.
1. “Robots in the Wild.” Girl Scouts of Central Illinois Camp Kiwanis Instructional Facility at Lake of the Woods, October 1, 2016, Mahomet, IL, USA.