

Yanqiu Yang

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With a robust background in agricultural and biological engineering, complemented by hands-on experience in cutting-edge projects and interdisciplinary research, my goal is to foster innovative teaching, research, and collaboration to address the challenges and opportunities in sustainable agriculture.

EDUCATION

The Pennsylvania State University

Ph.D., Agricultural and Biological Engineering

Dissertation: "From Seen to Unseen: Noninvasive Phenotyping of Plant Responses to Biotic Stress for Decision Making".

Advisor: Professor Paul Heinemann

University Park, PA

expected Fall 2024

China Agricultural University

MENG, *Digital Image Processing*, Mechanical Engineering

Beijing, China

06/2019

Harper Adams University

MSc, Applied Mechatronic Engineering

Newport, UK

02/2018

China Agricultural University

BENG, Mechanical and Electronics Engineering

Beijing, China

06/2016

RELATED PROFESSIONAL EXPERIENCE

bioWatch

Founder & AI Lead Engineer (Part-time)

State College, PA

01/2024 - Present

- Led a cross-functional team to design and implement innovative AI algorithms for biodiversity conservation.

John Deere, Intelligent Solutions Group

Program Manager (Full-time)

Tianjin, China

09/2020 - 08/2021

- Coordinated engineers and leadership from the US, Germany, and China to deploy telematics in the Chinese market.

John Deere, China Technology Innovation Center

Product Engineer (Full-time)

Tianjin, China

07/2019 - 09/2020

- Conducted yield mapping calibration in the factory and field testing on state farms.

Baidu Inc.

Business Operations Specialist (Internship)

Beijing, China

05/2018 - 07/2018

- Conducted decision-making data analysis and customer satisfaction improvements.

IceRobotics Ltd.

Product Engineer (Internship)

Edinburgh, Scotland

08/2017 - 10/2017

- Developed and implemented a shock testing jig for reliability tests of the cow monitoring sensor.

RESEARCH AND TEACHING INTERESTS

Precision/Digital Agriculture

Digital Entomology

Agricultural Automation

Remote Sensing

Plant Biotic Stresses

Plant Phenotyping

Agricultural IoTs

UAV Applications

AI in Agricultural Systems

SCHOLARLY PUBLICATIONS

- **Yang, Y.,** He, L., & Peter, K. A. (2023). Smartphone-assisted Apple Scab Identification and Quantification Using Artificial Intelligence. In *2023 ASABE Annual International Meeting* (p. 1). American Society of Agricultural and Biological Engineers.
- **Yang, Y.,** He, L. (2022). Apple Scab Severity Detection and Quantification Using Computer Vision. In *2022 Northeast Agricultural and Biological Engineering Conference (NABEC)*.
- Liang, X., Chen, B., Li, M., Wei, C., **Yang, Y.,** Wang, J., & Feng, J. (2019). Dynamic counting method of cotton rows in video based on centroid tracking. *Transactions of the Chinese Society of Agricultural Engineering*, 35(2), 175-82.
- Zhu, D., Chen, B., Liang, X., & **Yang, Y.** (2018). Apparatus for synchronous measuring three dimensional parameters of maize seeds based on oblique photography. *Transactions of the Chinese Society of Agricultural Engineering*, 34(4), 201-208.
- **Yang, Y.,** Cheng Z., Luo L., Yang S. (2017). Terra. Proceedings of the *15th Field Robot Event Competition*, Shropshire, UK.

MANUSCRIPTS IN PROGRESS

- “Approach to Biodiversity Protection: Employing AI and IoT Systems for the Containment of Box Tree Moth Proliferation.” Manuscript in progress, to be submitted for publication in Fall 2024.
- “Non-Invasive Detection of Defense Proteins in Tomato Plants Using Hyperspectral Imaging and Machine Learning.” Manuscript in progress, to be submitted for publication in Fall 2024.
- “Presymptomatic Detection of Fire Blight in Apple Orchards Using Portable Diffuse Reflectance Spectroscopy: A Machine Learning Approach.” Manuscript in progress, to be submitted for publication in Summer 2024.
- “Deep Learning for Apple Scab Identification and Severity Quantification.” Manuscript in progress, to be submitted for publication in Spring 2024.
- “Advanced Technologies for Precision Tree Fruit Disease Management: A Review.” Manuscript in progress, to be submitted for publication in Spring 2024.

SELECTED AWARDS AND HONORS

Top 9 Finalists, Digital Ag Hackathon, Cornell University	2024
Prototype Winner, Nittany AI Challenge, Penn State University	2024
InsectNET Travel Award, Penn State University	2024
3rd place, Engineering Research Poster Presentation, Graduate Research Exhibition, Penn State University	2023
Exceptional Collaborators Award, Intelligent Solutions Group, John Deere	2021
Scholarship Award, China Scholarship Council	2016
Silver Medal Winner, Women Volleyball College Competitions	2013
Best Debater, Freshmen Debate Competitions, China Agricultural University	2012

MAJOR RESEARCH GRANT ACTIVITY

Project Title	Role	Source	Amount Funded	Dates of Project
Smartphone-assisted apple diseases identification and quantification using artificial intelligence	Co-PI	State Horticultural Association of Pennsylvania	\$7,479	02/2023 - 02/2024

CONFERENCE PRESENTATIONS

- “Smartphone-assisted Apple Scab Identification and Quantification Using Artificial Intelligence.” Poster presentation delivered at the American Society of Agricultural and Biological Engineers Annual International Meeting, Omaha, NE, July 2023.
- “Smartphone-assisted Apple Diseases Identification and Quantification Using Artificial Intelligence.” Poster presentation delivered at the Mid-Atlantic Fruit and Vegetable Convention, Hershey, PA, February 2023.
- “Apple Scab Severity Detection and Quantification Using Computer Vision.” Oral presentation delivered at the Northeast Agricultural Biological Engineering Conference, Edgewood, MD, August 2022.

- “Deep Learning and Augmented Reality Toward a Mobile Solution for Scab Detection and Measurement in Apple Orchards.” Oral presentation delivered at the American Society of Agricultural and Biological Engineers Annual International Meeting, Houston, TX, July 2022.

INVITED TALKS

Panelist, “Approach to Biodiversity Protection: Employing AI and IoT Systems for the Containment of Box Tree Moth Proliferation.” To be delivered at the AI Colloquium for American Society for Horticultural Science Annual Conference, Honolulu, HI, September 2024.

Guest Speaker, “AI in Agricultural Extension Applications.” To be delivered for the podcast hosted by James Ladlee, State Program Leader for Emerging and Advanced Technology and Co-Director of the Penn State Marcellus Center for Outreach and Research, June 2024.

TEACHING AND ADVISING EXPERIENCE

Teaching Assistant Penn State University, University Park, PA
 Precision Agriculture (Professor Shirin Ghatrehsamani) Fall 2023

- Delivered an instructional session on yield mapping and monitoring to a class of 19 students, focusing on practical applications in precision agriculture.
- Developed and led a comprehensive review paper project tailored for five graduate students, focusing on current trends and advancements in precision agriculture.
- Responsible for grading student presentations, assessing their understanding and ability to communicate complex concepts effectively.

Teaching Assistant China Agricultural University, Beijing, China
 Digital Image Processing (Professor Bingqi Chen) Spring 2018

- Assisted in lab sessions on programming to achieve image processing tasks.

Mentor Harper Adams University, Newport, UK
 Engineering Workshop Spring 2017

- Guided high school students in learning about sensors and satellite navigation systems and assisted them in completing an autonomous toy car competition.

Mentor China Agricultural University, Beijing, China
 Undergraduate Capstone Fall 2016

- Managed and mentored one China Agricultural University undergraduate who finished a thesis project and served as a research assistant at Beihang University.

Invited Lecturer Yangxin Elementary School, Anhui, China
 Mathematics Teacher Spring 2013

- Developed lesson plans, taught school kids several sessions, and shared learning experiences.

RESEARCH AND STUDY EXPERIENCE

- Ph.D. fieldwork in Biglerville, PA, US (12 months; 05/2022 - 05/2023)
- Fieldwork for John Deere China in Heilongjiang and Xinjiang (04/2021 and 07/2021)
- Study at Harper Adams University, England, UK (12 months; 02/2017 - 02/2018)
- Master’s thesis fieldwork in Scotland, UK (08/2017 - 10/2017)
- Undergraduate fieldwork in Tianjin, China (Spring 2016)

EXTENSION AND OUTREACH ACTIVITIES

Scouting BSA, Penn State Agricultural Progress Days Site, Rockspring, PA 04/2023

- Introduced the applications of UAVs in agriculture settings to young scouts.

Plant Protection Field Day, Penn State Fruit Research and Extension Center 09/2022

- Demonstrated an autonomous orchard sprayer to chemical company representatives.

Ag Progress Days, Penn State	08/2022
<ul style="list-style-type: none"> ▪ Volunteered to interact with visitors at the “climate-smart agriculture and forestry” booth. 	
Penn State Fruit Research and Extension Center Biennial Field Day	07/2022
<ul style="list-style-type: none"> ▪ Helped set up the LiDAR-based intelligent sprayer demonstration for local apple growers. 	
Franklin County, PA	06/2022
<ul style="list-style-type: none"> ▪ Visited local growers and instructed them on setting up the smart irrigation system. 	
Field Demo, John Deere (Tianjin) Works	07/2021
<ul style="list-style-type: none"> ▪ Demonstrated the AutoTrac Turn Automation and Yield Mapping technologies to leadership and local farmers. 	
Factory Fly-in, John Deere (Tianjin) Works	01/2021
<ul style="list-style-type: none"> ▪ Taught and trained customers on satellite navigation systems and John Deere guidance products. 	
China International Import Expo, Shanghai, China	11/2020
<ul style="list-style-type: none"> ▪ Demonstrated AutoTrac Guidance, Turn Automation, RowSense, and Telematics to visitors. 	

LEADERSHIP AND ACADEMIC ENGAGEMENT

Treasurer, Department of Agricultural and Biological Engineering Graduate Student Council (2023 - Present)

Reviewer, *Frontiers in Plant Science* (2023)

Committee Member, ITSC 230 Biosensors, American Society of Agricultural and Biological Engineers (2022 - Present)

Judge, Future City Competition, American Society of Agricultural and Biological Engineers (2022)

Member Engineer, American Society of Agricultural and Biological Engineers (2021 - Present)

Member Engineer, Institution of Agricultural Engineers (2017 - 2018)

Member Engineer, Future Engineers Association, Institution of Mechanical Engineers (2012 - 2013)

Elected as member in:

Alpha Epsilon (Agricultural Engineering honor society)

PROFESSIONAL CERTIFICATION

Remote Pilot License (Small Unmanned Aircraft System), Department of Transportation, FAA

SOFTWARE COPYRIGHT

- Object Geometric Measurement System Based on the Mobile Terminal, 2018SRBJ0741
- Circular Steel Pipe Counting System Based on Machine Vision, 2018SRBJ0685
- Boundary Detection System of Farming Operation Area, 2018SRBJ0684
- Vision Navigation System for Corn Harvester, 2018SRBJ0595

SKILLS AND TECHNIQUES

- Expert-level knowledge, skills, and abilities in multispectral and hyperspectral image analysis and remote sensing.
- Proficient in computer vision, image processing, machine learning, and data analytics using Python, OpenCV, MATLAB, and R.
- Proficient in engineering design, simulation, and prototyping using SolidWorks, PTC Creo, AutoCAD.
- Excellent communication skills in written and spoken English and Mandarin.