Daeun “Dana” Choi

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Education:

Ph.D.	Agricultural and Biological Engineering, 2017	University of Florida
M.S.	Agricultural and Biological Engineering, 2013	University of Florida
B.S.	Bio-mechatronic Engineering, summa cum laude, 2011	Sungkyunkwan University, Korea
B.S.	Economics, 2011	Sungkyunkwan University, Korea

Professional Experience:

2022-present	Assistant Professor, Department of Agricultural and Biological Engineering, Gulf Coast Research and Education Center, University of Florida
2017-2021	Assistant Professor, Department of Agricultural and Biological Engineering, The Pennsylvania State University
2012-2017	Graduate Assistant, Precision Agriculture Laboratory, Department of Agricultural and Biological Engineering, University of Florida

Professional Responsibilities at UF:

Research (70%) Current research area is in the field of precision agriculture focusing on combining artificial intelligence (AI) and mechatronics with emphasis on improving sustainability, productivity, and safety in specialty crop production.
Extension (30%) My extension program focuses on delivering data and research/commercial products and implement precision agriculture systems in all sizes of farms throughout the state of Florida and beyond. Advise undergraduate/graduate students and post doc.

Areas of Expertise:

- Precision agriculture - Robotics/machine vision applications in specialty crop production
- Artificial intelligent and big data analysis for crop monitoring
- Autonomous ground and aerial vehicle applications in agriculture
- Synthetic data and digital twin technologies for agriculture

Awards and Honors:

2022 ASABE Rain Bird Engineering Concept of the Year award, American Society of Agricultural and Biological Engineers (July 15, 2022).
RBECY award honors engineers for unique contributions to the development or advancement of a new engineering concept. https://www.asabe.org/Awards-Competitions/Major-Awards

2019 Next Leaders Program, Commission of Agricultural and Biosystems Engineering (CIGR). (November 7, 2020).

Next Leaders Program brings the profession's future leaders together so that they can together learn the current state-of-the-art and build relationships with their colleagues from around the world.

New Faces of ASABE, The American Society of Agricultural and Biological Engineers. (March 1, 2019).
New Faces of ASABE are announced annually. Through the stories of these individuals, New Faces of ASABE aims to inspire their peers, the public, and future engineers who may follow in their footsteps. By their professional and personal achievements, the New Faces of ASABE are making a world of difference.

2019 UF ABE Outstanding Young Alumnus Award, University of Florida. (May 8, 2019).
This recognition is awarded to an alumnus or alumna of UF ABE (undergraduate or graduate, 45 or younger when nominated) and must have excelled in his/her chosen field or must have performed outstanding service for the profession.

Giuseppe Pellizzi Prize 2018, The Club of Bologna. (November 11, 2018). www.clubofbologna.org/.
The Club of Bologna and the Accademia dei Georgofili confer the "Giuseppe Pellizzi Prize", international competition reserved to PhD Theses related to the topic of Farm Machinery and Mechanization. The prize is awarded every two years.

AKABFE Service Award, Association of Korean Agricultural, Biological, and Food Engineers. (July 18, 2017). akabfe.org. akabfe.org.
The award was given in appreciation for outstanding service and commitment.

Outstanding Graduate Student Award, International Society of Precision Agriculture. (August 1, 2016). https://www.ispag.org/icpa/awards.
The purpose of this award is to recognize graduate student achievement, training, preparation, and research in the area of precision agriculture.

Achievement Award, College of Engineering, University of Florida. (August 15, 2011).
The College of Engineering Achievement Award for New Engineering Graduate Students provides a partial tuition waiver to students with outstanding academic records to pursue a degree program in engineering at the University of Florida.

Dean's Commendation for Academic Excellence, College of Biotechnology and Bioengineering, Sungkyunkwan University. (August 1, 2011).

Professional Activities:

International

Korean-American Scientists and Engineers Association. (July 1, 2014 - Present).
Association of Korean Agricultural, Biological, and Food Engineers. (July 1, 2013 - Present).
American Society of Agricultural and Biological Engineers. (December 1, 2012 - Present).
Club of Bologna (Guest member: Nov 1, 2018 – Nov 13, 2023, Full member Nov 13, 2023 - Present)

National

S1090: AI in Agroecosystems: Big Data and Smart Technology-Driven Sustainable Production (2022 - Present).
W3009: Integrated Systems Research and Development in Automation and Sensors for Sustainability of Specialty Crops (Multi-state project). Member (2018 - Present), Secretary (2019-2020), Vice Chair (2020-2021), Chair (2021-2022).
W2009: Integrated Systems Research and Development in Automation and Sensors for Sustainability of Specialty Crops (Multi-state project). (2017 - 2018).

Organizing Conferences and Service on Conference Committees

MS-48 Specialty Crop Engineering, American Society of Agricultural and Biological Engineers, Member. (July 31, 2018 - Present).
P-127 Robotics Student Design Competition Committee, American Society of Agricultural and Biological Engineers, Member. (July 31, 2018 - Present).
ITSC-512 Machine Vision Committee, American Society of Agricultural and Biological Engineers, Secretary (2018-2019), Vice Chair (2019-2020), Chair (2020-2021), Member. (July 15, 2015 - Present).
ITSC-254 Emerging Information Systems Committee, Secretary (2021-2022), Vice Chair (2022-Present)
ASABE Student Poster Presentation Competition, Machinery Systems (MS) Technical Community category, Judge. (August 1, 2018).
Conference session moderator and organizer in 'Machine Vision for Precision Agriculture and Robotics' (2016-Present)
Conference session moderator and organizer in Connectivity, Cloud Computing, and Internet of Things in Agriculture and Natural Resources (2023-Present)

List of Publications:

Journal Article

Mirbod, O., & Choi, D. (2023). A Strategy for Rapid Development of Machine Vision Systems for Strawberry Farms Through Digital Twins and Synthetic Data, *Computer and Electronics in Agriculture.* Under Review.

Mirbod, O., Choi, D., Heinemann, P. H., Marini, R. P., & He, L. (2023). On-tree apple fruit size estimation using stereo vision with deep learning-based occlusion handling. *Biosystems Engineering*, 226, 27-42.

Mahmud, M. S., He, L., Zahid, A., Heinemann, P., Choi, D., Krawczyk, G., & Zhu, H. (2023). Detection and infected area segmentation of apple fire blight using image processing and deep transfer learning for site-specific management. *Computers and Electronics in Agriculture*, 209, 107862.

Mahmud, M. S., He, L., Heinemann, P., Choi, D., & Zhu, H. (2023). Unmanned aerial vehicle based tree canopy characteristics measurement for precision spray applications. *Smart Agricultural Technology*, 4, 100153.

Mahmud, M. S., Zahid, A., He, L., Zhu, H., Choi, D., Krawczyk, G., & Heinemann, P. (2022). Development of An Automatic Airflow Control System for Precision Sprayers Based on Tree Canopy Density. Journal of the ASABE, 0.

Yuan, W., Choi, D., Bolkas, D., Heinemann, P. H., & He, L. (2022). Sensitivity examination of YOLOv4 regarding test image distortion and training dataset attribute for apple flower bud classification. International Journal of Remote Sensing, 43(8), 3106-3130. (open access)

Yuan, W., Choi, D., & Bolkas, D. (2022). GNSS-IMU-assisted colored ICP for UAV-LiDAR point cloud registration of peach trees. Computers and Electronics in Agriculture, 197, 106966. (open access)

Zhang, H., He, L., Di Gioia, F., Choi, D., Elia, A., & Heinemann, P. (2022). LoRaWAN based Internet of Things (IoT) System for Precision Irrigation in Plasticulture Fresh-market Tomato. Smart Agricultural Technology, 100053.

Zahid, A., Mahmud, M. S., He, L., Schupp, J., Choi, D., & Heinemann, P. (2022). An Apple Tree Branch Pruning Analysis. HortTechnology, 32(2), 90-98.

Mirbod, O., Choi, D., Thomas, R., & He, L. (2021). Overcurrent-driven LEDs for consistent image colour and brightness in agricultural machine vision applications. *Computers and Electronics in Agriculture*, 187, 106266.

Huang, M., He, L., Choi, D., Pecchia, J., & Li, Y. (2021). Picking dynamic analysis for robotic harvesting of Agaricus bisporus mushrooms. *Computers and Electronics in Agriculture*, 185, 106145.

Yuan, W., & Choi, D. (2021). UAV-Based Heating Requirement Determination for Frost Management in Apple Orchard. *Remote Sensing*, *13*(2), 273.

Mahmud, M. S., Zhid, A., He, L., Choi, D., Krawczyk, G., Zhu, H., & Heinemann, P. H. (2021). Development of a LiDAR-Guided Section-Based Tree Canopy Density Measurement System for Precision Spray Applications. *Computers and Electronics in Agriculture*, 182.

Zahid, A., Mahmud, M. S., He, L., Choi, D., Heinemann, P. H., & Schupp, J. R. (2020). Development of an integrated 3R end-effector with a cartesian manipulator for pruning apple trees. *Computers and Electronics in Agriculture, 179*, 105837.

Zahid, A., He, L., Zeng, L., Choi, D., Schupp, J. R., & Heinemann, P. H. (2020). Development of a robotic end-effector for apple tree pruning. *Transactions of the ASABE, 63*(4), 847-856.

Caliskan-Aydogan, O., Puri, V., Yi, H., Schupp, J. R., Choi, D., & Heinemann, P. H. (2020). Thermal properties of the 'Gala' apple during the growing season for predicting harvest time. *Transactions of the ASABE, 63*(2), 305-315.

Wang, C., Lee, W. S., Zou, X., Choi, D., Gan, H., & Diamond, J. (2018). Detection and counting of immature green citrus fruit based on the Local Binary Patterns (LBP) feature using illumination-normalized images. *Precision Agriculture*. ISBN/ISSN #/Case #/DOI #: https://doi.org/10.1007/s11119-018-9574-5, Online publication.

Choi, D., Lee, W. S., Ehsani, R., Schueller, J. K., & Roka, F. M. (2016). Detection of dropped citrus fruit on the ground and evaluation of decay stages in varying illumination conditions. *Computers and Electronics in Agriculture, 127*, 109–119. ISBN/ISSN #/Case #/DOI #: https://doi.org/10.1016/j.compag.2016.05.020

Choi, D., Lee, W. S., Ehsani, R., & Roka, F. M. (2015). A machine vision system for quantification of citrus fruit dropped on the ground under the canopy. *Transactions of the ASABE, 58*(4), 933–946. ISBN/ISSN #/Case #/DOI #: 10.13031/trans.58.10688

Refereed Conference Proceedings

Choi, D., Lee, W. S., Schueller, J. K., Ehsani, R., Roka, F., & Ritenour, M. (2014). A precise fruit inspection system for Huanglongbing and other common citrus defects using GPU and deep learning technologies. *13th International Conference on Precision Agriculture, Paper No. 1835, July 31 - August 4, 2016.* (pp. 1-6).

Choi, D., Lee, W. S., Yang, C., Ehsani, R., & Roka, F. (2014). Post-harvest quality evaluation system on conveyor belt for mechanically harvested citrus. *12th International Conference on Precision Agriculture, Paper No. 1459, July 20-22, 2014.* (pp. 1-10).

Conference Proceeding

Mirbod, O., & Choi, D. (2023). Synthetic Data-Driven AI Using Mixture of Rendered and Real Imaging Data for Strawberry Yield Estimation. In 2023 ASABE Annual International Meeting. American Society of Agricultural and Biological Engineers.

Mirbod, O., Choi, D., Heinemann, P. H., He, L., & Schupp, J. R. (2021). In-Field Apple Size and Location Tracking Using Machine Vision to Assist Fruit Thinning and Harvest Decision-Making. Paper presented at the 2021 ASABE Annual International Virtual Meeting.

Huang, M., Jiang, X., He, L., Choi, D., & Pecchia, J. (2020). Hand-picking dynamic analysis for robotic Agaricus mushroom harvesting. *2020 ASABE Annual International Meeting, Paper No. 2000415, July 12- 15, 2020.* (pp. 1-10).

Mirbod, O., Choi, D., Heinemann, P. H., & Marini, R. (2020). Towards image-based measurement of accurate apple size and yield using stereo vision cameras. *2020 ASABE Annual International Meeting, Paper No. 2001115, July 12- 15, 2020.* (pp. 1-6). (Advisor).

Lee, C.-H., Choi, D., Pecchia, J., He, L., & Heinemann, P. H. (2019). Development of A Mushroom Harvesting Assistance System using Computer Vision. *2019 ASABE Annual International Meeting, Paper No. 190050, July 7 – July 10, 2019.* (pp. 1-5). (Advisor).

Shi, X., Choi, D., Heinemann, P. H., Lynch, J. P., & Hanlon, M. (2019). RootRobot: A Field-based Platform for Maize Root System Architecture Phenotyping. *2019 ASABE Annual International Meeting, Paper No.1900806, July 7 – July 10, 2019.* (pp. 1-7). (Advisor).

Jarvinen, T., Choi, D., Heinemann, P. H., & Baugher, T. A. (2019). Tree trunk position estimation for

accurate fruit counts in apple yield mapping. *2019 ASABE Annual International Meeting, Paper No. 1900918, July 7 – July 10, 2019.* (pp. 1-7). (Advisor).

Jarvinen, T., Choi, D., Heinemann, P. H., & Baugher, T. A. (2018). "Multiple object tracking-by-detection for apple fruit counting on a tree canopy." *2018 ASABE Annual International Meeting, Paper No. 1801193, July 29 – Aug 1, 2018.* (pp. 1-8). (Advisor).

Choi, D., & Jarvinen, T. (2018). "A video processing strategy using camera movement estimation for apple yield forecasting." *Proceedings of the 9th International Symposium on Machinery and Mechatronics for Agriculture and Biosystems Engineering, page 1-5, Jeju, South Korea, May 28-30, 2018.* (pp. 1-5).

Choi, D., Lee, W. S., Schueller, J. K., Ehsani, R., Roka, F., & Diamond, J. (2017). A performance comparison of RGB, NIR, and depth images in immature citrus detection using deep learning algorithms for yield prediction. *2017 ASABE Annual International Meeting, Paper No. 1700076, July 16 – 19, 2017.* (pp. 1-6).

Choi, D., Lee, W. S., Ehsani, R., Schueller, J., & Roka, F. (2015). Machine vision system for early yield estimation of citrus in a site-specific manner. *2015 ASABE Annual International Meeting, Paper No. 152181863, July 26 – 29, 2015.* (pp. 1-6).

Choi, D., Lee, W. S., Ehsani, R., & Roka, F. M. (2014). Estimation of Prematurely Dropped Citrus Count on the Ground before Harvesting. *2014 ASABE Annual International Meeting, Paper No. 141892107, July 13– 16, 2014.* (pp. 1-8).

Choi, D., Lee, W. S., & Ehsani, R. (2013). Detecting and counting citrus fruit on the ground using machine vision. *2013 ASABE Annual International Meeting, Paper No. 131591603, July 21-24, 2013.* (pp. 1-5).

Book Chapter

Choi, D., Mirbod, O., & Wang, X. (2023). Strawberry Production in the Digital Age: AI Applications for Yield Estimation, Phenomics Prediction, and Digital Twin Technology, In Editor(s) – F., Rovira-Mas & V. S. Rubio - of book *Smart Agriculture: NextGen Agriculture: Novel Concepts & Innovative Strategies*, Milton Park, Abingdon, United Kingdom: Taylor and Francis. *(Under Review).*

Extension Publication

Choi, D., Mirbod, O., Ilodibe, U., & Kinsey, S. (2023). Understanding Artificial Intelligence: What It Is and How It Is Used in Agriculture: AE589, 10/2023. EDIS, 2023(6).

Presentations:

Oral Presentations

Choi, D. (2023). " A new approach to training agricultural robotics through synthetic data and digital twin" The 16th International Workshop on Nondestructive Quality Evaluation of Agricultural, Livestock and Fishery Products, November 7, 2023, Taipei, Taiwan.

Choi, D. (Presenter). (2023). “Improving crop production using machine learning and synthetic data for specialty crops”, Florida Phytopathological Society (FPS) 18th Biennial Meeting, Immokalee, FL. Plenary Presentation.

Choi, D. (Presenter). (2023). “Computer vision and digital twin technologies for specialty crop production”, The 2nd International Symposium on Global Trends and Challenges of Smart Farming Technologies and Applications. Kangwon National University, Chuncheon, Gangwon, South Korea, Online.

Choi, D. (Presenter). (2023). “How to cultivate AI in specialty crop production”. Tri-University Symposium (Palacký University Olomouc — University of Florida — University of Naples Federico II), April 21st, 2023, Indian Rocks Beach, FL.

Choi, D. (Presenter). (2023). “Updates on Digital Twin, Yield Forecasting, and Predatory Mite Release Systems for Strawberry”, 41st Annual Strawberry Agritech Conference, May 17, 2023, Plant City, FL

Mirbod, O. (Presenter) & Choi, D. (2023). "Synthetic Data-Driven AI Using Mixture of Rendered and Real Imaging Data for Strawberry Yield Estimation" 2023 American Society of Agricultural and Biological Engineers Annual International Meeting, Omaha, NE. (Advisor).

Mirbod, O. (Presenter) & Choi, D. (2023). " Creating Synthetic Data and Simulated Environment of Plasticulture Production Beds and Strawberry Plants for Training Agricultural Robotics Perception" AI in Agriculture: Innovation and Discovery to Equitably Meet Producer Needs and Perception, April17, 2023, Orlando, FL, (Advisor).

Choi, D. (Presenter). (2022) "How to Cultivate AI in Specialty Crop Production," Invited presentation, Climate Smart Agriculture meeting, Technical Session 1: Approaches to CSA from U Fl from technology and innovations to no-low cost approaches, Cairo, Egypt.

Mirbod, O. (Presenter) & Choi, D. (2022). "Improving Fruit Visibility and Yield Estimation in Tomato Imaging Using Forced Air Flow on Plant Canopy" 2022 American Society of Agricultural and Biological Engineers Annual International Meeting, Houston, TX. (Advisor).

Yuan, W. (Presenter), & Choi, D. (2022). " Apple blossom density estimation and mapping through UAV-based RGB photogrammetry", 2022 American Society of Agricultural and Biological Engineers Annual International Meeting, Houston, TX, International. (Advisor).

Choi, D. (Presenter), & Yuan, W. (2022). " Mapping Apple Flower Stages for Frost Protection Decisions, as Well as Yield and Fruit Sizing", 2022 International Fruit Tree Association 65th Annual Conference and Tours, Hershey, PA, TX, International.

Choi, D. (Presenter). (February 11, 2021). "Computer Vision & Drone Imaging in Apple Orchards" Mid-Atlantic Fruit and Vegetable Convention, State Horticultural Association of Pennsylvania, Virtual.

Yuan, W. (Presenter), & Choi, D. (July 13, 2020). "Flowering Stage Classification and Temperature Monitoring for Frost Damage Management in Apple Orchard Using UAV-based RGB and Thermal Cameras," 2020 American Society of Agricultural and Biological Engineers Annual International Meeting, Online. International. (Advisor).

Mirbod, O. (Presenter), Choi, D., Heinemann, P. H., & Marini, R. (July 13, 2020). "Towards Image-Based Measurement of Accurate Apple Size and Yield using Stereo Vision Cameras," 2020 American Society of Agricultural and Biological Engineers Annual International Meeting, Online. International. (Advisor).

Lee, C.-H. (Presenter), Choi, D., Heinemann, P. H., Pecchia, J., & He, L. (June 14, 2020). "Mushroom maturity identification using computer vision," 5th CIGR International Conference 2020, Cancelled due to Covid-19. International. (Advisor).

Choi, D. (Presenter). (January 29, 2020). "Apple Yield Estimation Using Computer Vision Technology," 2020 Mid-Atlantic Fruit and Vegetable Convention, State Horticultural Association of Pennsylvania, Pennsylvania Vegetable Growers Association, Maryland State Horticultural Society, and New Jersey State Horticultural Society, Hershey, PA. Regional.

Choi, D. (Presenter). (November 21, 2019). "Medium: Integrated Design of Sensing, Networks, and Cooperative Control of Multi-Vehicle Systems for Preventing Frost and Freeze Damage to Flowers and Buds of Fruit Trees," Tenth Annual Cyber-Physical Systems PI meeting, NSF, Arlington, Virginia.

Lee, C.-H. (Presenter), Choi, D., Heinemann, P. H., Pecchia, J., & He, L. (July 8, 2019). "Development of A Mushroom Harvesting Assistance System using Computer Vision," 2019 American Society of Agricultural and Biological Engineers Annual International Meeting, Boston, MA. International. (Advisor).

Shi, X. (Presenter), Choi, D., Heinemann, P. H., Lynch, J. P., & Hanlon, M. (July 8, 2019). "RootRobot: A Field-based Platform for Maize Root System Architecture Phenotyping," 2019 ASABE Annual International Meeting, ASABE, Boston, MA. International. (Advisor).

Jarvinen, T. (Presenter), Choi, D., Heinemann, P. H., & Baugher, T. A. (July 8, 2019). "Tree trunk position estimation for accurate fruit counts in apple yield mapping," 2019 ASABE Annual International Meeting, ASABE, Boston, MA. International. (Advisor).

Choi, D. (Presenter), Lee, C.-H., He, L., & Zahid, A. (June 17, 2019). "Automating mushroom harvesting in Pennsylvania using machine vision and robotics," 2019 Northeast Agricultural and Biological Engineering Conference, Quebec City, Quebec, Canada. International.

Choi, D. (Presenter). (November 24, 2018). 28th Club of Bologna annual member meeting, Intelligent vision sensors for citrus industry, Bologna, Italy. International.

Choi, D. (Co-Presenter), & He, L. (October 7, 2018). "Technologies for robotic mushroom harvesting

– detection and removal," 60th Penn State Mushroom Short Course, University Park, PA.

Jarvinen, T. (Presenter), Choi, D., Heinemann, P. H., Schupp, J. R., & Baugher, T. A. (July 31, 2018). "Multiple object Tracking-by-detection for apple fruit counting on a tree canopy," 2018 American Society of Agricultural and Biological Engineers Annual International Meeting, Detroit, MI. International. (Advisor).

Choi, D. (Presenter), & Jarvinen, T. (May 29, 2018). "A video processing strategy using camera movement estimation for apple yield forecasting," 9th International Symposium on Machinery and Mechatronics for Agriculture and Biosystems Engineering, Korean Society for Agriculture Machinery, Japanese Society of Agricultural Machinery and Food Engineers, Chinese Institute of Agricultural Machinery, Jeju, South Korea. International.

Choi, D. (Presenter), & He, L. (January 30, 2018). "Introduction of New Faculties at Penn State Ag & Biological Engineering and Future Direction for Research," 2018 Mid-Atlantic Fruit and Vegetable Convention, State Horticultural Association of Pennsylvania, Pennsylvania Vegetable Growers Association, Maryland State Horticultural Society, and New Jersey State Horticultural Society, Hershey, PA. Regional.

Choi, D. (Presenter). (October 24, 2017). "Smart farming: how intelligent sensing system is shaping future agriculture," Millennium Cafe, Materials Research Institute and Huck Life Sciences Institute at Penn State, University Park, PA, Invited. Local.

Choi, D. (Presenter). (September 14, 2017). "2017 Florida Research Summary," W2009, United States Department of Agriculture National Institute of Food and Agriculture, Biglerville, PA, 12 in attendance. National.

Choi, D. (Presenter). (July 18, 2017). "A performance comparison of RGB, NIR, and depth images in immature citrus detection using deep learning algorithms for yield prediction," 2017 American Society of Agricultural and Biological Engineers Annual International Meeting, Spokane, Washington. International.

Choi, D. (Presenter). (August 25, 2016). "Fast and automatic inspection of citrus HLB and other common defects," 2016 Citrus Packinghouse Day, UF/IFAS Extension service, Lake Alfred, Florida, 40 in attendance, Invited. State.

Choi, D. (Presenter). (August 1, 2016). "A precise fruit inspection system for HLB and common citrus diseases using GPU and deep learning technology," 13th International Conference on Precision Agriculture, International Society of Precision Agriculture, St. Louis, Missouri, 20 in attendance. International.

Choi, D. (Presenter). (July 19, 2016). "A citrus yield forecasting system using Kinect depth and infrared sensors," 2016 American Society of Agricultural and Biological Engineers Annual International Meeting, Orlando, Florida. International.

Choi, D. (Presenter). (July 28, 2015). "Machine vision system for early yield estimation of citrus in a

site-specific manner.," 2015 American Society of Agricultural and Biological Engineers Annual International Meeting, New Orleans, Louisiana. International.

Choi, D. (Presenter). (July 21, 2014). "Post-harvest quality evaluation system on conveyor belt for mechanically harvested citrus," 12th International Conference on Precision Agriculture, International Society of Precision Agriculture, Sacramento, California. International.

Choi, D. (Presenter). (July 15, 2014). "Estimation of prematurely dropped citrus count on the ground before harvesting," 2014 American Society of Agricultural and Biological Engineers Annual International Meeting, Montreal, Canada. International.

Choi, D. (Presenter). (July 23, 2013). "Detecting and counting citrus fruit on the ground using machine vision," 2013 American Society of Agricultural and Biological Engineers Annual International Meeting, Kansas City, Missouri. International.

Posters

Choi, D. (Oct 28, 2022). AI Applications in Specialty Crop Production, AI Days, University of Florida, Gainesville, FL. (Poster)

Choi, D. (June 22, 2022). AI Applications in Specialty Crop Production, AI Summit, University of Florida, Gainesville, FL. (Poster)

Jarvinen, T., & Choi, D. (July 10, 2018). "Fruit detection and tracking for yield prediction in apple orchards," 100th Anniversary Field Day, Penn State Fruit Research and Extension Center, Biglerville, PA. Regional.

Choi, D. (2015). Future citrus yield forecast: green citrus detection system using infrared and depth images. ABE Poster Symposium, University of Florida, Gainesville, FL. (Poster)

Choi, D. (2014). Quantification of fruit drop using machine vision system. ABE Poster Symposium, University of Florida, Gainesville, FL, 2014. (Poster)

Choi, D. (2013). Outdoor image enhancement for citrus fruit drop detection using Retinex theory. ABE Poster Symposium, University of Florida, Gainesville, FL, 2013. (Poster)

Seminars

Choi, D. (Presenter). (2023). “Enhancing Sustainable Crop Production with Machine Learning, Synthetic Data, and Digital Twin for Strawberry”, Biocomplexity Engineering Group Seminar, Gainesville, FL, September 19, 2023. Online.

Choi, D. (Presenter). (2023). “Improving Crop Production using Machine Learning and Digital Twin for Specialty Crops.”, IFAS Certified Crop Adviser Educational Program, June 4, 2023. Online.

Choi, D. (Presenter). (2023). “A New Approach to Training Agricultural Robotics through Synthetic Data and Digital Twin”, UF IFAS AI and Data Science Seminar Series, June 27, 2023. Online. Available at: https://youtu.be/urQ8pI-kpC0?si=676OiYzI999BYLE8.

Choi, D. (Presenter). (2023). “Improving Apple Harvest with the Latest in AI Yield Estimation for Specialty Crops”, PACMAN Research and Extension - Engineering Research Show and Tell, Webinar, Mar 9, 2023. (Recording available at: https://youtu.be/ByPGzqZQEuQ?si=XTiLreNXUOzZXGv8).

Choi, D. (Presenter). (November 8, 2022) "How to Cultivate AI in Specialty Crop Production," Invited seminar, Rural Development Administration, South Korea

Choi, D. (Presenter). (February 3, 2022). "How to cultivate AI in Specialty Crop Production," Invited seminar, Department of Mechanical and Aerospace Engineering, University of Florida, Gainesville, FL.

Choi, D. (Presenter). (March 3, 2020). "Precision Farming: How Intelligent Systems Are Shaping Future Agriculture," CyberScience Seminar Series, Penn State Institute for Computational and Data Sciences, University Park.

Choi, D. (Presenter). (February 27, 2020). "CPS for precision agriculture," 2020 Electrical Engineering Colloquia, Penn State Department of Electrical Engineering and Computer Science, University Park.

Choi, D. (Presenter). (June 1, 2018). "Current technologies for Pennsylvania's specialty crop production and future research directions," Invited seminar, Rural Development Administration, Jeonju, South Korea, Jeonju, South Korea.

Choi, D. (Presenter). (June 1, 2018). "Current technologies for Pennsylvania's specialty crop production and future research directions," Invited seminar, Jeollabuk-do Agricultural Research and Extension Services, Iksan, South Korea, Iksan, South Korea.

Choi, D. (Presenter). (June 1, 2018). "Current technologies for Pennsylvania's specialty crop production and Introduction of Penn State ABE program," Invited seminar, Chonbuk National University, Jeonju, South Korea, Jeonju South Korea.

Choi, D. (Presenter). (May 30, 2018). "Sensors for precision agriculture for Pennsylvania's specialty crops," Invited seminar, Sunchon National University, Sunchon, South Korea, Sunchon, South Korea.

Outreach - Review of Federal Grant Programs:

NSF, Panel Member. (May 9-10, 2022).
2021 NRI-3.0: National Robotics Initiative program
Reviewed a total of 5 proposals

USDA NIFA, Panel Member. (April 20-22, 2022).
2021 AFRI A1521-Engineering for Agricultural Production Systems program
Reviewed a total of 12 proposals

USDA NIFA, Panel Member. (December 7, 2020 - December 10, 2020).

2020 Food and Agriculture Cyber informatics Tools (FACT) Program
Reviewed a total of 12 proposals

USDA NIFA, Panel Member. (June 15, 2020 - June 17, 2020).
2019 Food and Agriculture Cyber informatics Tools (FACT) Program
Reviewed a total of nine proposals

USDA NIFA, Panel Member. (March 3, 2020 - March 5, 2020).
2019 Small Business Innovation Research (SBIR) Program
Reviewed a total of 13 proposals

USDA NIFA, Panel Member. (January 28, 2019 - January 30, 2019).
2018 Food and Agriculture Cyberinformatics and Tools (FACT) Program
Reviewed a total of 11 proposals

USDA NIFA, Ad-hoc Reviewer. (September 26, 2018).
2017 Food and Agriculture Cyberinformatics and Tools (FACT) program
Reviewed one proposal

USDA NIFA, Panel Member. (February 14, 2018 - February 16, 2018).
2017 Small Business Innovation Research (SBIR) program
Reviewed a total of eight proposals

Outreach and Extension Activities:

Demonstrations

Choi, D. & Mirbod, O. (February 6, 2023), "AI applications for strawberry production", Field demonstration at 2023 The Research Center Administrators Society meeting, GCREC, Wimauma, FL.

Choi, D. & Mirbod, O. (November 2, 2022), "AI applications for strawberry production", Field demonstration at 2022 Florida Ag Expo.

Choi, D. (Co-Presenter), He, L., Heinemann, P. H., Mirbod, O., Shi, X., Lee, C.-H., Reimer, T., & Zahid, A. (August 13, 2019 - August 15, 2019). "Advancing agricultural sensing and automation," 2019 Penn State Ag Progress Day, Pennsylvania Furnace, Pennsylvania. Local.

Choi, D. (Presenter). (July 10, 2018). "Computer vision system for apple production assistance in PA," 100th Anniversary Field Day, Penn State Fruit Research and Extension Center, Biglerville, PA. Regional.

Lectures for Public Audiences

Choi, D. (Presenter). (January 18, 2023). " LiDAR and Thermal Imaging Applications & Crop Health Map using NDVI", In-Service Training- Collection and analysis of drone image data using open-source hardware and software, Mid-Florida Research and Education Center, Apopka, University of Florida, FL

Choi, D. (Presenter). (March 15, 2022). "How to cultivate AI in Specialty Crop Production", In-Service Training- How could modern agricultural technologies improve horticulture crops in Florida? Virtual meeting, University of Florida, FL

Choi, D. (Presenter). (July 29, 2022). "How to cultivate AI in Specialty Crop Production," Invited seminar, Disney's Animals, Science and Environment – EPCOT, Orlando, FL.

Computer Vision & Drone Imaging in Apple Orchards. On-Line, 135 Participants. (February 11, 2021). 2021 Mid-Atlantic Fruit and Vegetable Convention.

Mushroom maturity identification using computer vision. Short Course, Instructor, Extension Program, Kennett Square, PA. (October 1, 2019). 2019 Penn State Mushroom short course.

Apple Yield Estimation Using Computer Vision Technology, Instructor, Classroom, External to Penn State, Hershey, PA, 50 participants. (January 29, 2019). 2019 Mid-Atlantic Fruit and Vegetable Convention.

Robotic mushroom harvesting – Mushroom Maturity Index Sensing System, Short Course, Instructor, Extension Program, State College, PA, 50 participants, External to Penn State, Professional. (October 9, 2018). 2018 Penn State Mushroom short course.

Computer vision system for apple production assistance in PA, Extension Program, Extension Program, Penn State Fruit Research and Extension Center, Biglerville, PA. (July 10, 2018). 100th Anniversary Field Day.

Introduction of new faculties and future direction for research, Conference, Instructor, Extension Program, Hershey, PA, 100 participants, External to Penn State, Professional. Spring (January 31, 2018). 2018 Mid-Atlantic Fruit and Vegetable Convention, Hershey, PA

Fast and automatic inspection of citrus HLB and other common defects, Instructor, Extension Program, UF/IFAS Extension service, Lake Alfred, Florida, 40 in attendance, (August 25, 2016). 2016 Citrus Packinghouse Day.

Grant Writing Experiences:

Awarded

Date of Funding	Investigators	Project Title and Award Agreement Number	Sponsor	Candidate's Role	Amount
Start Date: 01/01/2023 End Date: 05/30/2024	Choi, Daeun and Wang, Xu	Harnessing the Potential of Agricultural Robotics Perception and Control: Sim-to-Real Transfer in Agriculture Using Synthetic Data	UF IFAS Archer Early Career Seed Grant	Principal Investigator	$49,774
Start Date: 09/01/2022	Choi, Daeun	Integrated Approach for Precision Strawberry	FL Strawberry	Principal Investigator	$44,381

End Date: 08/30/2023		Yield Forecasting Alert from Flowering to Harvest Award Agreement number: AGR00025614	Research and Education Foundation		
Start Date: 09/01/2022 End Date: 08/30/2023	Choi, Daeun	Development of ground vehicle based predator mites releasing platform Award Agreement number: AGR00025629	FL Strawberry Research and Education Foundation	Principal Investigator	$47,822
Start Date: 01/01/2022 End Date: 06/25/2025	Choi, Daeun, He, Long, Pecchia, John, et al.	SCRI: An Integrated Approach to Address the Labor Shortage on Mushroom Farms Through Smart Agriculture Award Agreement number: 2021-51181-35859	USDA National Institute of Food and Agriculture	Co-Principal Investigator	$3,795,968
Project Start Date: 09/01/2020 Project End Date:08/31/2024	Robinson, Terence (PD), Cheng, Lailiang, Daeun Choi, et. al.	SCRI: Precision Crop Load Management for Apples Award Agreement number: 2020-51181-32197	USDA National Institute of Food and Agriculture (Cornell subaward)	Co-Principal Investigator	Total awarded (to date, if applicable): $4,833,889
Date Requested: 07/25/2019 Date Awarded: 07/02/2020 Start Date: 07/01/2020 End Date: 06/30/2023	He, Long, Choi, Daeun, Heinemann, Paul, Schupp, James R.	AFRI (A1521) Green Fruit Removal Dynamics and Robotic Green Fruit Thinning System. Award Agreement number: 2020-67021-31959	USDA National Institute of Food and Agriculture	Co-Principal Investigator	Total requested: $422,955.00 Total anticipated: $422,955.00 Total awarded (to date, if applicable): $422,955.00
Date Requested: 05/08/2018	Choi, Daeun, He, Long, Heinemann,	CPS: Medium: Integrated Design of Sensing, Networks, and	National Science Foundation/	Principal Investigator	Total requested: $936,627.00

Date Awarded: 06/05/2019 Start Date: 03/15/2019 End Date: 03/14/2022	Paul, Crassweller, Robert M., Sommer, Henry J	Cooperative Control of Multi-Vehicle Systems for Preventing Frost and Freeze Damage to Flowers and Buds of Fruit Trees. Award Agreement number: 2019-67021-29224	USDA National Institute of Food and Agriculture		Total anticipated: $843,329.00 Total awarded (to date, if applicable): $843,329.00
Requested: 07/01/2016 Date Awarded: 05/01/2017 Start Date: 07/19/2017 End Date: 07/18/2021	Lynch, Jonathan, Heinemann, Paul, Brown, Kathleen M., Choi, Daeun	DEEPER: an integrated phenotyping platform for deeper roots.	U. S. Department of Energy Advanced Research Projects Agency-Energy	Co-Investigator	Total requested: $8,898,000.00 Total awarded (to date, if applicable): $7,000,000.00
Date Requested: 12/19/2018 Date Awarded: 07/23/2019 Start Date: 04/01/2019 End Date: 12/31/2020	., Schupp, James R., Choi, Daeun	Evaluation of Effective Canopy Depths of Apple Trees for Optimal Machine Sensing Performance - Year 2. Award Agreement number: SHAP-2019	State Horticultural Association of Pennsylvania	Principal Investigator	Total requested: $12,885.00 Total anticipated: $.00 Total awarded (to date, if applicable): $12,885.00
Date Requested: 12/18/2018 Date Awarded: 07/23/2019 Start Date: 04/01/2019 End Date: 12/31/2020	He, Long, Schupp, James R., Baugher, Tara A., Choi, Daeun	A Sensor-Based Irrigation Test System for Apple Orchards. Award Agreement number: SHAP-2019	State Horticultural Association of Pennsylvania	Co-Principal Investigator	Total requested: $13,244.00 Total anticipated: $13,244.00 Total awarded (to date, if

					applicable): $13,244.00
Date Requested: 12/18/2018 Date Awarded: 07/23/2019 Start Date: 04/01/2019 End Date: 12/31/2020	He, Long, Schupp, James R., Choi, Daeun	Branch and Fruit Accessibility for Mechanical Operations with Various Tree Canopies. Award Agreement number: SHAP-2019	State Horticultural Association of Pennsylvania	Co-Principal Investigator	Total requested: $23,488.00 Total anticipated: $13,244.00 Total awarded (to date, if applicable): $11,744.00
Date Requested: 12/14/2018 Date Awarded: 07/23/2019 Start Date: 04/01/2019 End Date: 12/31/2020	Crassweller, Robert M., Smith, Don, Choi, Daeun	Effects of Maintenance of Training Systems to a Hedgerow. Award Agreement number: SHAP-2019	State Horticultural Association of Pennsylvania	Co-Investigator	Total requested: $9,100.00 Total anticipated: $9,100.00 Total awarded (to date, if applicable): $9,100.00
Date Requested: 01/02/2018 Date Awarded: 07/27/2018 Start Date: 03/01/2018 End Date: 12/31/2019	He, Long, Schupp, James R., Baugher, Tara A., Choi, Daeun	A sensor based irrigation test system for apple orchards. Award Agreement number: 211766	State Horticultural Association of Pennsylvania	Co-Principal Investigator	Total requested: $28,048.00 Total anticipated: $14,024.00 Total awarded (to date, if applicable): $14,024.00
Date Requested: 01/02/2018	Choi, Daeun, Schupp, James R., He, Long	Evaluation of Effective Canopy Depths of Apple Trees for Optimal Machine Sensing Performance.	State Horticultural Association of Pennsylvania	Principal Investigator	Total requested: $27,069.00

Date Awarded: 07/27/2018 Start Date: 05/01/2018 End Date: 12/31/2019		Award Agreement number: 211871			Total anticipated: $14,184.00 Total awarded (to date, if applicable): $14,184.00
Date Requested: 12/21/2017 Date Awarded: 07/16/2018 Start Date: 05/01/2018 End Date: 12/31/2019	Crassweller, Robert M., Choi, Daeun	Effects of Maintenance of Training Systems to a Hedgerow. Award Agreement number: 211572	State Horticultural Association of Pennsylvania	Co-Investigator	Total requested: $13,753.00 Total anticipated: $13,753.00 Total awarded (to date, if applicable): $13,753.00
Date Requested: 03/01/2018 Date Awarded: 05/22/2018 Start Date: 07/01/2018 End Date: 05/31/2019	He, Long, Schupp, James R., Choi, Daeun, Heinemann, Paul, Baugher, Tara A.	New concept of mechanical/robotic pruning end-effector for fruit trees.	The Stoy G. and Della E. Sunday Program Support for Fruit Production Research	Co-Investigator	Total requested: $4,758.00 Total anticipated: $4,758.00 Total awarded (to date, if applicable): $4,758.00
Date Requested: 01/04/2018 Date Awarded: 02/16/2018 Start Date: 05/01/2018 End Date: 04/30/2019	He, Long, Choi, Daeun, Schupp, James, Baugher, Tara	A sensor-based irrigation test system for apple orchards.	State Horticultural Association of Pennsylvania	Co-Investigator	Total requested: $14,024.00 Total anticipated: Total awarded (to date, if applicable): $14,024.00

Date Requested: 04/15/2019 Date Awarded: 06/03/2019 Start Date: 07/01/2019 End Date: 06/30/2020	Choi, Daeun, He, Long, Pecchia, John	Development of a Computer Vision and a Robotic End-Effector for Automated Harvesting of Pennsylvania Mushroom - Year 2.	Mushroom Research Competitive Grants Program	Principal Investigator	Total requested: $25,000.00 Total anticipated: $25,000.00 Total awarded (to date, if applicable): $25,000.00
Date Requested: 03/15/2018 Date Awarded: 05/21/2018 Start Date: 07/01/2018 End Date: 05/31/2018	Choi, Daeun, He, Long, Pecchia, John	Development of a Computer Vision and a Robotic End-Effector for Automated Harvesting of Pennsylvania Mushroom.	Mushroom Research Competitive Grants Program	Principal Investigator	Total requested: $24,204.00 Total anticipated: 24,204.00 Total awarded (to date, if applicable): $24,204.00
Date Requested: 04/12/2018 Date Awarded: 04/20/2018 Start Date: 07/01/2018 End Date: 06/30/2018	Schupp, James R., Crassweller, Robert M., He, Long, Choi, Daeun	A small equipment grant for cost-share towards the purchase of an orchard hedger.	College of Agricultural Science Small Equipment Grant	Co-Investigator	Total requested: $5,600.00 Total anticipated: $5,600.00 Total awarded (to date, if applicable): $5,600.00
07/07/2020	Michael, Judd H., Choi, Daeun, Brown, Stephen H.	Opportunities for Unmanned Aerial Vehicles in Agricultural Safety.	Northeast Center for Agricultural and Occupational Health	Co-Principal Investigator	Total requested: $25,000.00

02/21/2020	Choi, Daeun, He, Long, Heinemann, Paul	Precision Crop Load Management for Apples.	USDA-NIFA SCRI sub-contract to Cornell University	Co-Investigator	Total requested: $347,002.00
01/10/2020	He, Long, Choi, Daeun, Schupp, James R.	Branch and Fruit Accessibility for Mechanical Operations with Various Tree Canopies (Year 2).	State Horticultural Association of Pennsylvania	Co-Investigator	Total requested: $11,476.00
01/10/2020	Choi, Daeun, He, Long, Schupp, James R.	Targeted Blossom/Green Fruit Thinning with Variable Rate Sprayer.	State Horticultural Association of Pennsylvania	Co-Investigator	Total requested: $18,270.00
01/08/2020	Choi, Daeun, Marini, Richard	Developing of Machine Sensing Methodology for Accurate Fruit Sizing in An Apple Orchard.	State Horticultural Association of Pennsylvania	Principal Investigator	Total requested: $11,649.00

Teaching Experiences:

List of Credit Courses Taught

Semester & Year	Course	Course Title	Credits	Enrollment	Type of Instruction	Instructor Role
University of Florida						
Spring 2022	AOM5456	Applied Methods in Smart Ag Systems	3	5	In Person	Co-Instructor
Penn State University						
Fall 2020	ASM 424	Sel Mgmt Ag Mach	3	11	COVID Mixed Mode	Primary Instructor
Fall 2020	BRS 221	Engineering Principles of Biorenewable Systems	3	10	COVID Mixed Mode	Primary Instructor
Spring 2020	ABE 596	Individual Studies	3	2	In Person	Primary Instructor
Spring 2020	BE 497	Design Principles for Bio-	3	10	In Person	Primary Instructor

		Mechatronic Systems				
Fall 2019	ASM 424	Sel Mgmt Ag Mach	3	12	In Person	Primary Instructor
Fall 2019	BRS 221	Eng Princ Brs	3	15	In Person	Primary Instructor
Spring 2019	ABE 596	Individual Studies	3	1	In Person	Primary Instructor
Spring 2019	BE 497	Design Principles for Bio-Mechatronic Systems	3	8	In Person	Primary Instructor
Fall 2018	ASM 424	Selection and Management of Agricultural Machinery	3	7	In Person	Primary Instructor
Fall 2018	BRS 221	Engineering Principles of Biorenewable Systems	3	23	In Person	Primary Instructor
Summer 2018	BE 496	Indep Studies	3	1	In Person	Primary Instructor

Teaching Evaluation Scores

Semester & Year	Course	Number of Respondents (%)	Overall Quality of Course (max 7)	Overall Quality of Instructor (max 7)
Fall 2020	ASM 424	45.50	5 (median)	6 (median)
Fall 2020	BRS 221	33.33	5 (median)	5 (median)
Spring 2020	BE 497	70	5.71	5.29
Fall 2019	ASM 424	83.30	3.90	4.10
Fall 2019	BRS 221	40.00	3.83	3.17
Spring 2019	BE 497	75.00	5.33	5.33
Fall 2018	ASM 424	42.90	5.67	5.67
Fall 2018	BRS 221	34.80	4.63	4.38

Supervision of Graduate and Undergraduate Students

Ph.D. Dissertation Committee Chair

Dutt, N. (Advisor, University of Florida, Dept. of Ag. and Bio. Engineering), Ph.D. "Robotics Solutions for Selective Mushroom Harvesting." (January, 2023 - Present).

Ilodibe, U. (Advisor, University of Florida, Dept. of Ag. and Bio. Engineering), Ph.D. "Automation of Bio-control of Harmful Pests in Strawberry Production." (August, 2022 - Present).

Mirbod, O. (Advisor, University of Florida, Dept. of Ag. and Bio. Engineering), Ph.D. "Synthetic Data and Simulation for Strawberry Robotics Development." (January, 2021 - Present).

Yuan, W. (Advisor, Pennsylvania State University, Dept. of Ag. and Bio. Engineering), Ph.D. "Applications of UAV-Based Remote Sensing in Apple Orchards: Frost Prevention, Tree Parameter Estimation and Fruit Detection." (August, 2019 – May 2022).

Master's Thesis Committee Chair

Mirbod, O. (Advisor, Pennsylvania State University, Dept. of Ag. and Bio. Engineering), MS. "Image-based measurement of accurate apple size and yield using stereo vision cameras." (August, 2019 – April, 2021).

Reimer, T. (Advisor, Pennsylvania State University, Dept. of Ag. and Bio. Engineering), MS. "Machine vision application using drone images for developing a black cherry tree phenology model." (August, 2019 - Present).

Lee, C.-H. (Advisor, Pennsylvania State University, Dept. of Ag. and Bio. Engineering), MS. "Development of a mushroom harvesting assistance system using computer vision." (August, 2018 – May, 2020).

Jarvinen, T. (Advisor, Agricultural and Biological Engineering), MS, "Early Season Yield Prediction of Apple Orchards." (August, 2017 - April, 2019).

Ph.D. Dissertation Committee Member

Lindow, L. (University of Florida, Department of Agricultural and Biological Engineering), Ph.D., "Decision-making Capabilities of Digital Twin to Improve Growers' Abilities to Optimize Operations based on Yield and Sustainability." (August 2022 - Present).

Cerbaro, V. (University of Florida, Department of Agricultural and Biological Engineering), Ph.D., "Improved Strawberry Advisory System with the Application of AI and Gridded Weather Products." (May 2022 - Present).

Mahmud, M. S. (Penn State University, Department of Agricultural and Biological Engineering), Ph.D., "Development of a LiDAR-guided Precision Spray Applications." (January 2020 – December 2021).

Zahid, A., (Penn State University, Department of Agricultural and Biological Engineering), Ph.D., "Development of a Robotic End-Effector for Apple Tree Pruning." (January, 2019 – December 2021).

Master's Thesis Committee Member

Hershey, J., (Penn State University, Department of Agricultural and Biological Engineering), MS., "An evaluation of airborne lidar based individual tree detection methods in a northeaster US forest." (May, 2020 - Present).

Caliskan-Aydogan, O., M.S, "Changes in Thermal Properties During the Growing Season to Predict the Apple Harvest Time and Monitor the Quality." (November, 2017 - April, 2018).

Postdoctoral Mentorship

Shi, X. (Co-Advisor, Penn State University, Department of Agricultural and Biological Engineering), Ph.D., "RootRobot: Developing Field Excavation and Phenotyping Tools for Maize Root." (October, 2017 – December, 2020).

Supervision of Funded Undergraduate Research

Reimer, T. (Advisor, Penn State University, Department of Agricultural and Biological Engineering), BS., "Developing an Tracer Injection Equipment for Maize Root Phenotyping." (March, 2018 - April, 2019).

Burns, M. (Advisor, Penn State University, Department of Agricultural and Biological Engineering), BS., "Developing Image Processing for Field Imaging in Apple Orchards" (May, 2018 - August, 2018).

Media Coverage:

Article, "Agriculture industry looks to new technology to raise, harvest Florida crops", Fox 13, https://www.fox13news.com/news/agriculture-industry-looks-to-new-technology-to-raise-harvest-florida-crops. (December 27, 2022)

Article, "AI center coming to Gulf Coast Research and Education Center", MorningAgClips, https://www.morningagclips.com/ai-center-coming-to-gulf-coast-research-and-education-center/ (Oct 15, 2022)

Article, "Frost defense by air and ground", Good Fruit Grower, https://www.goodfruit.com/frost-defense-by-air-and-ground/ (April 7, 2022).

Article, "New Scientist Joins Southern Hillsborough County Researchers", Osprey Observer TV, https://www.ospreyobserver.com/2022/03/new-scientist-joins-southern-hillsborough-county-researchers/ (March 9, 2022).

Article, "Precision crop load management is the topic of our time", Good Fruit Grower, https://www.goodfruit.com/precision-crop-load-management-is-the-topic-of-our-time/. (March 18, 2021)

Article, "Novel lighting system designed for machine vision module of agricultural robots", Penn State News. https://www.psu.edu/news/research/story/novel-lighting-system-designed-machine-vision-module-agricultural-robots/ (Oct 12, 2021)

Article, "USDA grant supports Penn State research on mushroom industry automation", https://www.morningagclips.com/usda-grant-supports-penn-state-research-on-mushroom-industry-automation/ (September, 20, 2021)

Article, "New Robotic Mechanism Developed for Picking and Trimming Button Mushrooms", AZO Robotics, https://www.azorobotics.com/News.aspx?newsID=12294 (June 2, 2021)

Article, "Prototype of robotic device to pick, trim button mushrooms", ScienceDaily, https://www.sciencedaily.com/releases/2021/06/210601165047.htm (June 1, 2021)

Advertisement video, "Exposure to Major Series: Biological Engineering", Penn State College of Engineering, https://www.youtube.com/watch?v=hVEuofuf2ww&t=22s. (Jan 27, 2020)

Article, "Novel cutting mechanism devised for automated, robotic apple-tree pruning system," Newspaper, Penn State News, https://news.psu.edu/story/626728/2020/07/24/research/novel-

cutting-mechanism-devised-automated-robotic-apple-tree. (July 24, 2020).

Article, "Researcher to discuss how precision farming can meet growing food demand," Newspaper, Penn State News, https://news.psu.edu/story/608712/2020/02/18/public-events/researcher-discuss-how-precision-farming-can-meet-growing-food. (February 18, 2020).

Article, "Growing technology: Gadgets can help farmers prosper," Journal or Magazine, Altoona Mirror, https://www.altoonamirror.com/news/local-news/2019/08/growing-technology-gadgets-can-help-farmers-prosper/. (August 16, 2019).

Article, "Automation on display at Ag Progress Days", CNH News, https://www.cnhinews.com/pennsylvania/article_e5e82d54-be06-11e9-8f72-e7af8c3fb89b.html (Aug 13, 2019).

Article, "NSF grant supports development of robotic frost protection in orchards," Journal or Magazine, EurekAlert, https://www.eurekalert.org/pub_releases/2019-03/ps-ngs032619.php. (March 16, 2019).

Article, "Giuseppe Pellizzi Prize: premiata l'innovazione nella meccanica agraria," Journal or Magazine, AgroNotizie, https://agronotizie.imagelinenetwork.com/agrimeccanica/2018/11/22/giuseppe-pellizzi-prize-premiata-l-innovazione-nella-meccanica-agraria/60694. (November 22, 2018).

Article, "New agricultural engineering faculty will advance research, technology," Newspaper, Penn State News, https://news.psu.edu/story/485309/2017/09/29/academics/new-agricultural-engineering-faculty-will-advance-research. (September 29, 2017).

Article, "Method shines light on citrus decay," Journal or Magazine, MorningAgClips. (June 30, 2016).

Article, "New method tells growers more about citrus decay," Web, UF/IFAS News, http://blogs.ifas.ufl.edu/news/2016/06/30/new-method-tells-growers-more-about-citrus-decay/ (June 30, 2016).

Article, "Device created to help get a leg up on citrus fruit drop," Journal or Magazine, Growing Produce, http://www.growingproduce.com/citrus/insect-disease-update/device-created-to-help-get-a-leg-up-on-citrus-fruit-drop/. (August 13, 2015).

Article, "Machine could help map citrus drop patterns," Newspaper, The Ledger, http://www.theledger.com/news/20150823/machine-could-help-map-citrus-drop-patterns. (August 13, 2015).

Article, "Machine counts early dropped citrus," Journal or Magazine, FreshPlaza.com, http://www.freshplaza.com/article/144235/Machine-counts-early-dropped-citrus. (August 13, 2015).

Article, "Researchers develop machine to count dropped citrus, identify problem areas in groves,"

Journal or Magazine, PHYS.org, https://phys.org/news/2015-08-machine-citrus-problem-areas-groves.html. (August 13, 2015).

Article, "U of Florida Researchers Develop machine to count dropped citrus, identify problem areas," Journal or Magazine, AgriMarketing, http://www.agrimarketing.com/s/98023. (August 13, 2015).

Article, "UF researchers develop device to count citrus fruit drop," Newspaper, Brazil Business Today, http://brazilbusiness.einnews.com/article/280936982/live. (August 13, 2015).

Article, "UF researchers develop device to count citrus fruit drop," Newspaper, Washington Times, http://www.washingtontimes.com/news/2015/aug/13/uf-researchers-develop-device-to-count-citrus-frui/. (August 13, 2015).

Article, "UF Researchers Develop machine to count dropped citrus, identify problem areas," Journal or Magazine, Southeast Ag Net, http://southeastagnet.com/2015/08/12/uf-researchers-develop-machine-to-count-dropped-citrus/. (August 13, 2015).

Article, "UF Researchers Develop Machine to Count Dropped Citrus," Journal or Magazine, Southeast Ag Net, http://southeastagnet.com/2015/08/12/uf-researchers-develop-machine-to-count-dropped-citrus/. (August 12, 2015).