

Qin Zhang

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A. Educational Background

1991 Ph.D. Agricultural Engineering University of Illinois at Urbana-Champaign (UIUC)
1988 M.S. Agricultural Engineering University of Idaho
1982 B.S. Mechanical Engineering Zhejiang Agricultural University (China)

B. Professional Employment

Since 2010 Director, Center for Precision and Automated Agricultural Systems, WSU
Since 2009 Professor, Washington State University (WSU)
1997-2009 Assistant Professor, Associate Professor, & Professor, UIUC
1994-1997 Senior Research Engineer, Caterpillar Inc., Peoria, IL
1992-1994 Post-Doctoral Research Associate, UIUC

C. Other Professional Leadership and Affiliations (Current Only)

Since 2022 Chair Editor: *Computer and Electronics in Agriculture*, An Elsevier Journal
Since 2021 Editor-in-Chief: *Encyclopedia of Smart Agriculture Technologies*, Springer Nature
Since 2020 Member, Washington State Academy of Sciences
Since 2020 Fellow, International Academy of Agricultural and Biological Engineering (IAABE)
Since 2018 Springer Guest Editor: *Agricultural Automation* Book Series
Since 2018 Honorary Vice President, CIGR (International Commission of Agricultural and Biosystems Engineering)
Since 2017 Trustee, Foundation Board of ASABE (American Society of Agricultural and Biosystems Engineers)
Since 2014 Editorial Board Member: *Information Processing in Agriculture*
Since 2013 Fellow, ASABE
Since 2009 Full Member, Club of Bologna - A World Taskforce on Strategies for the Development of Agricultural Mechanization

D. Selected Leaderships for Major International Conferences (8 total, 3 examples)

1. Chair, International Program Committee, 6th IFAC AgriControl Conference, Sydney,

Australia (December 1-4, 2019)

2. Chair, International Program Committee, 5th IFAC AgriControl Conference, Seattle, WA, (August 14-17, 2016)
3. Chair, International Program Committee, 4th IFAC Bio-Robotics Conference, Champaign, IL, USA (July 13-15, 2009)

E. Selected Major Honors and Recognitions

1. Rain Bird Engineering Concept of the Year Award, ASABE (2020)
2. John Deere Gold Medal, ASABE (2017)
3. Leadership Citation, ASABE (2015)
4. Faculty Award for Excellence in Research, College of ACES, UIUC (2005)
5. Collins Award for Innovative Teaching, College of Engineering, UIUC (1999)

F. Synergistic Activities (54 Total, 9 examples listed)

1. **Keynote** Speech: *Agricultural Cybernetics, The Need for a New Study in Agricultural Automation*, the XX CIGR World Congress, Kyoto, Japan. (December 8, 2022)
2. **Keynote** Speech: *Agricultural Cybernetics*, 6th IFAC AgriControl Conference, Sydney, Australia (December 4, 2019)
3. **Invited** Speech: *Redefine Agriculture for Robotic Farming*, 9th Asian Leadership Conference, Seoul, South Korea, (May 17, 2018)
4. **Invited** Speech: *Agricultural Robotics: Special Challenges and Possible Solutions*, IEEE/RAS International Conference on Robotics and Automation (ICRA 2018), Brisbane, Australia, (May 25, 2018)
5. **Invited** Speech: *Smart Agriculture: Potentials, Challenges and Solutions*, INTA International Course on Precision Horticulture; General Roca, Argentina, (May 10, 2017)
6. **Invited** Speech: *Agricultural Robotics: The Needs, Impacts and Strategies*, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2017), Vancouver, Canada, (September 28, 2017)
7. **Invited** Speech: *Technical Obstacles and Possible Solutions for Agricultural Robotics*. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2015), Hamburg, Germany, (October 1, 2015)
8. **Keynote** Speech: *Opportunity of Robotics in Specialty Crop Production*, IFAC Bio-Robotics Conference, Sakai, Japan, (March 28, 2013).
9. **Keynote** Speech: *Agricultural Systems and Controls*, IFAC Symposium on Dynamics and Control in Agriculture and Food Processing (DYCAF), Plovdiv, Bulgaria, (June 14, 2012)

G. Publications and Creative Works

(i) 12 Books and 27 Separate Book Chapters (9 examples listed)

1. Zhang, Q. 2023. *Encyclopedia of Smart Agriculture Technologies*. Springer Cham, ISBN: 978-3-030-89123-7, <https://doi.org/10.1007/978-3-030-89123-7> (in press).
2. Vougioukas, S.G. and Q. Zhang, 2023. *Advanced Automation for Tree Fruit Orchards and Vineyards*. Springer, ISBN: 978-3-031-26940-0, (241 pp).
3. Huang, Y. and Q. Zhang, 2021. *Agricultural Cybernetics*. Springer, ISBN: 978-3-030-72101-5,

(255 pp). <https://doi.org/10.1007/978-3-030-72102-2>.

4. Karkee, M. and Q. Zhang, 2021. *Fundamentals of Agricultural and Field Robotics*. Springer, ISBN: 978-3-030-70399-8, (455 pp). <https://doi.org/10.1007/978-3-030-70400-1>.
5. Zhang, Q. 2019. *Basics of Hydraulic Systems (2nd Edition)*. CRC Press, ISBN: 978-1-1384-8466-5, (338 pp). <https://doi.org/10.1201/9780429197260>.
6. Karkee, M., Zhang, Q., Silwal, A. (2021). Agricultural Robots for Precision Agricultural Tasks in Tree Fruit Orchards. In: Bechar, A. (eds) *Innovation in Agricultural Robotics for Precision Agriculture*. Progress in Precision Agriculture. Springer, Cham. https://doi.org/10.1007/978-3-030-77036-5_4.
7. Rovira-Más, F., Q. Zhang, and V. Saiz-Rubio, 2020. Chapter 11. Mechatronics and Intelligent Systems in Agricultural Machinery. In: Holden, N. M., Wolfe, M. L., Ogejo, J. A., & Cummins, E. J. (Ed.), *Introduction to Biosystems Engineering*. Virginia Tech Publishing. <https://doi.org/10.21061/IntroBiosystemsEngineering/Mechatronics>.
8. Zhang, Q., M. Karkee, and A. Tabb, 2019. Chapter 14. The Use of Agricultural Robots in Orchard Management. In: Billingsley, J. (ed); *Robotics and Automation for Improving Agriculture*. Burleigh Dodds (28 pp). <https://doi.org/10.19103/AS.2019.0056.14>.
9. Zhang, Q. J. Dvorak, and T. Oksanen, 2018. Chapter 9. Intelligent Machinery for Precision Agriculture. In: Stafford, J. (ed). *Precision Agriculture for Sustainability*. Burleigh Dodds (20 pp). <https://doi.org/10.1201/9781351114592>.

(ii) 260+ Peer-reviewed Journal and Other Learned Articles (9 examples listed)

1. Kang, C., G. Diverres, K. Manoj, Q. Zhang, and M. Keller, (2023). Decision-support system for precision regulated deficit irrigation management for wine grapes. *Computers and Electronics in Agriculture*, 208. <https://doi.org/10.1016/j.compag.2023.107777>.
2. Arnoldussen, B., J. Alhamid, C. Mo, X. Zhang, P. Wang, Q. Zhang, and M. Whiting, 2022. Cellulose nanocrystal dispersions improve cold tolerance in developing apple flowers. *Acta Horticulturae*. 1346, 407-412, <https://doi.org/10.17660/ActaHortic.2022.1346.51>.
3. Bhusal, S., U. Bhattarai, M. Karkee, Y. Majeed, and Q. Zhang, 2022. Automated execution of pest bird deterrence system using a programmable unmanned aerial vehicle (UAV). *Computers and Electronics in Agriculture*. <https://doi.org/10.1016/j.compag.2022.106972>.
4. Zhang, X., M. Karkee, Q. Zhang, and M.D. Whiting, 2021. Computer vision-based tree trunk and branch identification and shaking points detection in dense-foliage canopy for automated harvesting of apples. *Journal of Field Robotics*, 1-18. <https://doi.org/10.1002/rob.21998>.
5. Majeed, Y., M. Karkee, Q. Zhang, L. Fu, and M.D. Whiting, 2020. Determining grapevine cordon shape for automated green shoot thinning using semantic segmentation-based deep learning networks. *Computers and Electronics in Agriculture*, 171. Article 105308. <https://doi.org/10.1016/j.compag.2020.10538>.
6. He, L., X. Zhang, Y. Ye, M. Karkee, and Q. Zhang, 2019. Effect of shaking location and duration on mechanical harvesting of fresh market apples. *Applied Engineering in Agriculture*, 35(2): 175-183. <https://doi.org/10.13031/aea.12974>.

7. Ye, Y., L. He, Z. Wang, D. Jones, G. Hollinger, M. Taylor, and Q. Zhang, 2018. Orchard manoeuvring strategy for a robotic bin-handling machine. *Biosystems Engineering*. 169: 85-103. <https://doi.org/10.1016/j.biosystemseng.2017.12.005>.
8. Amatya, S., M. Karkee, Q. Zhang, and M.D. Whiting 2017. Automated detection of branch shaking locations for robotic cherry harvesting using machine vision. *Robotics*, 6(4): 31. <https://doi.org/10.3390/robotics6020031>.
9. Silwal A, J.R. Davidson, M. Karkee, C. Mo, Q. Zhang, K. Lewis, 2017. Design, integration, and field evaluation of a robotic apple harvester. *Journal of Field Robotics*. 34(6): 1140-1159. <https://doi.org/10.1002/rob.21715>.

(iii) 12 US Patents (3 examples listed)

1. Zhang, X., C. Mo, M.D. Whiting, and Q. Zhang, 2021. Plant-based compositions for the protection of plants from cold damage. United States Patent No. US 11,122,751 B2.
2. Davidson, J.R., C. Mo, Q. Zhang, A. Silwal, and M. Karkee, 2017. Robotic systems, methods, and end-effectors for harvesting produce. United States Patent No. 9,554,512 B2.
3. Zhang, Q., L. He, and H.J. Charvet, 2013. Knot-tying device and method. United States Patent No. 8,573,656 B1.

H. Selected Funded Research Projects (Current Only)

1. PMU: AI Institute: Agricultural AI for transforming workforce and decision support (AgAID) (NSF/USDA-NIFA), 07/21-07/26, \$20,000,000, Institute Associate Director (Ag)
2. High-resolution vineyard nutrient management (USDA-NIFA-SCRI), 09/20-08/24, Co-PD
3. Advancing robotic approaches to pollination for improved yield and quality in fruit crops (USDA-SCMS), 05/20-05/24, \$993,835