

# Yongkai Ye

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You can find more information about me on this website: [Github-Yongkai Ye's Profile](#)

## Education

- 2022 – 2025 **M.Sc. in Agricultural Mechanization Engineering (Expected)** IELTS in preparation  
[Zhejiang University](#), Hangzhou, China Advisor: Associate Fellow [Dongdong Du](#)
- 2018 – 2022 **B.Eng. in Electronics and Information Engineering** GPA: 3.89/4.0 Rank: 1/60  
[Northwest A & F University](#), Yangling, China Advisor: Associate Professor [Jiao Guo](#)

## Researches

### Research Interests

- Soft Robotics, Soft Grippers, Soft Actuators, Finite Element Method, Fluid-Structure Interaction Analysis, Sensing, and Machine Learning

### Research Projects



- 2024 – 2026 **Research on adaptive grasping method of agricultural robots based on flexible tactile perception (Major Participant, In Preparation)**  
Funding: National Natural Science Foundation of China
- 2021 – 2023 **Research on fruit-picking mechanism of particle-jamming soft gripper (Major Participant)**  
Funding: Natural Science Foundation of Zhejiang Province  
**Material Characteristic Study:** Several typical pulpy fruits were selected as the experimental samples and their physical, compressing, and fractional characteristics were studied for the gripper design.  
**Actuator Design:** [Pneumatic Networks](#) was employed as the basis for our soft gripper, and sand was selected as the particle-jamming material. The volume ratio of sand to air chamber was varied to study the influence of the usage of sand for enhancing the grasping performance.  
**Surface Response Measurement:** The grasping force was measured by a flexible thin-film force transducer, and the damage ratio of different pulpy fruits was calculated by the thermal imaging technique. Then, I built a map among different volume ratios, grasping forces, and fruit damage ratios.
- 2019 – 2022 **Measurement of wheat head traits via 3D reconstruction using sequence images (Principal)**  
Funding: National Student Research Training Program  
**Platform Construction:** I built a customized frame using aluminum profiles with a three-axis slider and a camera mounted to obtain the multi-view sequence images.  
**3D Reconstruction:** With the help of my partners, multi-view sequence images were employed for 3D reconstruction using [Marching Cubes](#) algorithm.  
**Point Cloud Processing and Measuring:** The generated 3D point cloud results were processed to remove artifacts and measured by [Point Cloud Library](#) for comparison with actual experiments.

### Research Experiences







- 2022 – 2024 **Development of a variable-curvature soft gripper for orientating broccoli in the trimming line (Independent Research)**  
We presented a novel pneumatic variable-curvature soft gripper (VCSG) for orientating broccoli self-adaptively in the trimming line. The proposed VCSG first applied specific pressurizing pressure to form a hook shape and generated additional lifting forces to the bottom of the broccoli head to guide the broccoli upright and then clamped it using the clamping forces by further increasing the pressure.
- 2023 – 2024 **Modelling and analysis of soft fiber-reinforced bending actuators (Independent Research)**  
We presented two methods for modeling the soft fiber-reinforced bending actuators, where one used the nonlinear machine learning algorithms combined with the finite element method and the other employed fluid-structure interaction analysis.

Advised by Associate Fellow Dongdong Du in Zhejiang University




# International Conference

- 2024  **Yongkai Ye (Oral Presentation in Preparation)** and Dongdong Du. *ASABE 2024 Annual International Meeting*, July 28, 2024, Anaheim, America.
-  **Yongkai Ye (Oral Presentation in Preparation)**, Chaoyue Han, and Dongdong Du. *11th IEEE International Conference on CIS-RAM*, August 8, 2024, Hangzhou, China.





## Publications

- 1 **Y. Ye**, C. Han, and D. Du, "Fluid-structure interaction modelling and analysis of soft fiber-reinforced bending actuator (under review)," *International Journal of Mechanical Science*, 202x.
- 2 **Y. Ye**, C. Han, R. B. Scharff, *et al.*, "Development of a novel variable-curvature soft gripper used for orientating broccoli in the trimming line (under review)," *Computers and Electronics in Agriculture*, 202x.
- 3 **Y. Ye**, R. B. Scharff, S. Long, C. Han, and D. Du, "Modelling of soft fiber-reinforced bending actuators through transfer learning from a machine learning algorithm trained from fem data," *Sensors and Actuators A: Physical*, p. 115 095, 2024.  url: <https://doi.org/10.1016/j.sna.2024.115095>.
- 4 D. Du, **Y. Ye**, D. Li, *et al.*, "Nondestructive evaluation of harvested cabbage texture quality using 3d scanning technology," *Journal of Food Engineering*, p. 112 123, 2024.  url: <https://doi.org/10.1016/j.jfoodeng.2024.112123>.
- 5 J. Luo, J. Guo, Z. Zhu, Y. Du, and **Y. Ye**, "Optimal feature extraction from multidimensional remote sensing data for orchard identification based on deep learning methods," *Journal of Applied Remote Sensing*, vol. 18, 2024.  url: <https://doi.org/10.1117/1.jrs.18.014514>.
- 6 J. Guo, J. Bai, **Y. Ye**, C. Han, and W. Zhang, "A dataset of multi-source and multi-temporal remote sensing data of cash crop planting structure in yangling agricultural demonstration zones," *China Scientific Data*, vol. 8, 2023.  url: <https://doi.org/10.11922/11-6035.noda.2022.0002.zh>.
- 7 **Y. Ye**, K. Yu, and Y. Zhao, "The development and application of advanced analytical methods in microplastics contamination detection: A critical review," *Science of The Total Environment*, vol. 818, p. 151 851, 2022.  url: <https://doi.org/10.1016/j.scitotenv.2021.151851>.
- 8 Y. Zhao, S. Fang, **Y. Ye**, and K. Yu, "Chemometric development using portable molecular vibrational spectrometers for rapid evaluation of avc (valsa mali miyabe et yamada) infection of apple trees," *Vibrational Spectroscopy*, vol. 114, p. 103 231, 2021.  url: <https://doi.org/10.1016/j.vibspec.2021.103231>.

## Skills




- Languages  English (Proficient in reading and writing and Fluent in speaking) Mandarin Chinese (Native)
- Coding  Python, Matlab, C++, C, LabVIEW,  $\LaTeX$ , ...
- Software  SolidWorks, Abaqus, Anasys, Origin, ...

## Awards and Honors




- 2021 – 2022  2022 The Mathematical Contest in Modeling (**Honorable Mention**)
- 2020 – 2021  **National Scholarship**  
12th China Undergraduate Mathematical Final Contest (**The Third Prize, National Award**)
- 2019 – 2020  **National Scholarship**  
12th China Undergraduate Mathematical Contest (**The First Prize, Provincial Award**)
- 2018 – 2019  **President Scholarship** 2019 China Robot Competition (**The First Prize**)  
11th China Undergraduate Mathematical Contest (**The First Prize, Provincial Award**)

## Referee

### Yanru Zhao

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### Dongdong Du

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