Yuanhao Zheng

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Research Interests: Food quality, AI-enabled food system

EDUCATION

Zhejiang University (ZJU) ***Hangzhou, China***

M.Eng. in Agricultural Engineering | Grade: 88.6/100 *09/2022 – 06/2025*

Agricultural Systems Modeling and Big Data Analytics (93), Bio-systems Detection and Control Technologies (93), Engineering Analysis of Biological System (98), Special Topic of Precision Farming Technology (88)

Zhejiang University (ZJU) ***Hangzhou, China***

B.Eng. in Food Science & Engineering | GPA: 3.61/4.0 *09/2017 – 06/2021*

Analytical Chemistry (89), Postharvest Technology of Fresh Fruit and Vegetables (89), Food Sensory Evaluation (94), Food Microbiology (86), Fermentation Technology (95), Food Additives (92), Dairy Technology (93)

PUBLICATIONS

[1] **Zheng, Y.**, Luo, X., Gao, Y., Sun, Z., Huang, K., Gao, W., Xu, H., Xie, L.* Lycopene detection in cherry tomatoes with feature enhancement and data fusion. ***Food Chem.***, 2024. [DOI]

[2] **Zheng, Y.**, Liu, P., Zheng, Y., et al. Improving SSC detection accuracy of cherry tomatoes by feature synergy and complementary spectral bands combination. ***Postharvest Biol. Technol.***, 2024. [DOI]

[3] **Zheng, Y.**, Zhou, Y., Liu, P., et al. Improving discrimination accuracy of pest-infested crabapples using Vis/NIR spectral morphological features. ***J. Food Meas. Charact.***, 2024. [DOI]

[4] Li, J., **Zheng, Y.**, Wang, P.*, Zhang, H.* The alginate dialdehyde crosslinking on curcumin-loaded zein nanofibers for controllable release. ***Food Res. Int.***, 2024. [DOI]

[5] Liu, P., **Zheng, Y.**, et al. Enhancing fruit SSC detection accuracy via a light attenuation theory-based correction method to mitigate measurement orientation variability. ***Food Res. Int.***, 2024. [DOI]

[6] **Patent:** Xie, L., **Zheng, Y.**, Xu, H., Gao, T. Detection equipment and method for carotenoid content in fruits. China Patent Application, 2023116457571. filed Dec 4th, 2023. (Patent Pending)

RESEARCH EXPERIENCE

[1] Nondestructive detection of lycopene content in cherry tomatoes *06/2022 – 09/2024*

- Improved nondestructive detection accuracy for lycopene in cherry tomatoes through UV/Vis/NIR spectral enhancement and spectra-image fusion.
- Validated correlation between lycopene content and fruit surface color as well as image features.
- Enhanced characteristic spectral bands related to these colors and implemented spectra-image fusion methods, achieving a prediction R^2 of 0.95 for lycopene content.
- Detected fruit quality from the perspective of supplement and interpretation of raw information.

[2] Soluble solids content prediction of cherry tomatoes *03/2023 - 09/2024*

- Improved nondestructive prediction performance for soluble solids content (SSC) in cherry tomatoes using UV/Vis/NIR spectroscopy, achieving a prediction R^2 of 0.97.
- Confirmed characteristic absorption spectral bands of soluble sugars and matched these features with the spectral shape of the light source, collecting spectral information correlated with SSC.

- Proposed the feature synergy and spectral bands combination strategy for SSC prediction.

[3] Pest-infested crabapples discrimination using Vis/NIR spectroscopy *10/2023 - 08/2024*

- Discriminated pest-infested crabapples by compensating for the influence of external orientation and enhancing differences in spectral morphological features (SMFs).
- Utilized a global model incorporating multiple crabapple orientations to mitigate external position impacts, resulting in improved classification accuracy compared to the single-position local model.
- Investigated and applied SMFs to amplify the differences between healthy and pest-infested crabapples' spectra, achieving an average discrimination accuracy of 95.94%.
- Classified crabapples in terms of influence elimination and difference amplification.

[4] The crosslinked electrospun nanofibers for controllable curcumin release

(Undergraduate Thesis, Advisor: Prof. Hui Zhang) *10/2020 – 06/2021*

- Prepared zein/alginate dialdehyde (AD) electrospun nanofibers through green crosslinking.
- Enhanced the nanofiber's physical/mechanical properties, hydrophobicity, and swelling ratio, while reduced weight loss in water through high cross-linking degree.
- Loaded curcumin (CUR) with nanofiber, achieved effective encapsulation and controlled release, and noted a gradual antioxidant behavior rise corresponding to the release behavior.
- Constructed electrospun membrane for the protection and controlled release of phytochemicals.

ACADEMIC ACTIVITIES

Services

- Part-time counselor for undergraduate students in 1st year *08/2023 – 07/2024*
- Peer review service for *Food Control* *05/2024 – present*

Awards

- Excellent Postgraduate Students' Award *2024 - 2025*
- National Scholarship *2023 – 2024*
- Five-Excellence Graduate Student of Zhejiang University *2023 – 2024*
- Award of Honor for Graduate, ZJU *2023 - 2024*
- National Encouragement Scholarship *2018 – 2019*

Conference Presentations

- Jul. 2024: Lycopene detection in cherry tomatoes with feature enhancement and data fusion, 13th Applied Optics and Photonics China (**AOPC 2024**), Oral, Beijing, China.
- May. 2024: Improving SSC detection accuracy of cherry tomatoes by feature synergy and spectral combination, the 6th CIGR International Conference 2024 (**CIGR 2024**), Oral, Jeju, South Korea.
- Aug. 2023: Nondestructive detection of soluble solids and lycopene content in cherry tomatoes using NIRS, Chinese Society of Agricultural Engineering (**CSAE 2023**), Poster, Chengdu, China.

SKILLS

Language: Mandarin (native), English (TOEFL98)

Program Skills: C/C++, MATLAB, Python

Experimental Skills: Machine/Deep learning, Near-infrared Spectroscopy, Spectral data analysis, Machine vision and image processing, Fruits quality evaluation, Chemical analysis