Chiao-Yi (Charlene) Wang

• cyiwang@umd.edu • 240-764-9439 • College Park, MD
• Website: https://chiaoyiwang0424.github.io/ • in/chiao-yi-wang-685416149

Summary

Ph.D. Candidate in Bioengineering specializing in **machine learning for biomedical imaging, computer vision and signal processing**. Experienced in developing deep learning frameworks for multimodal datasets spanning 1D-3D modalities, including optical and hyperspectral imaging as well as physiological data. Skilled in feature extraction, segmentation, and image classification with proficiency in Python, PyTorch, and OpenCV. Strong publication record in leading journals and conferences (IEEE TNSRE, Biomedical Optics Express, ICCV, ICASSP, EMBC).

Education

Ph.D. in Bioengineering, University of Maryland, College Park   08/2020 – 05/2026 (Expected)

M.S. in Biomedical Electronics and Bioinformatics, National Taiwan University   09/2016 – 06/2018

B.S. in Electrical Engineering, National Taiwan University   09/2012 – 06/2016

Technical Skills

Programming: Python, PyTorch, OpenCV, C/C++, MATLAB, Javascript, SQL, LaTex, CUDA, DB2, Verilog

Applications: Computer Vision, Medical Imaging, Hyperspectral Imaging, Bio-signal Processing, Multimodal Data Fusion

Professional Experience

Graduate Research Assistant

Bio-Imaging and Machine Vision lab, University of Maryland (PI: Prof. Yang Tao)

08/2020 – Present | College Park, MD, USA

- Established a deep learning–based computer vision framework integrating multimodal image registration and cell tracking to quantify 4D erythrocyte flow rates in the retina (Biomedical Optics Express'24)
- Developed deep learning models for privacy-preserving fall risk assessment using on body cameras (IEEE TNSRE'25, ICASSP'24).
- Created a data collection path planning framework for smart precision shellfish harvesting (IEEE Access'24).
- Devised hyperspectral imaging pipeline for glucose monitoring with deep regression models (EMBC'21).
- Designed and implemented a human pose retrieval framework utilizing multimodal large language models (MLLMs) (ICCV'25).

Application Developer (IT Specialist)

IBM

09/2018 – 06/2020 | Hsinchu, Taiwan

- Developed real-time dispatcher (IBM SiView RTD) and data migration tool.
- Supported MES system maintenance projects for TSMC.

Graduate Research Assistant

Biomedical Optical Spectroscopy and Imaging lab, National Taiwan University (PI: Prof. Kung-Bin Sung)

09/2016 – 08/2018 | Taipei, Taiwan

- Developed a non-invasive bio-optical method to detect oxygen saturation of deep veins (EMBC'17, SPIE Photonics West'18).
- Established a multi-wavelength optical system to detect the change of dermal collagen concentration in real time (Photonics'19, SPIE Photonics West'18).
- Analyzed bio-optical imaging of skin melanin concentration using non-invasive bio-optical method (Biomedical Optics Express'20).

Undergraduate Research Assistant

Cellular Mechanism and Biophysics lab, National Taiwan University (PI: Prof. Po-Ling Kuo)

07/2014 – 02/2016 | Taipei, Taiwan

- Developed a tumor interstitium-mimicking platform for evaluation of cytotoxic T lymphocyte-mediated killing of tumor cells.

Undergraduate Research Assistant

Lab for Data Processing Systems, National Taiwan University (PI: Prof. Yi-Chang Lu)

09/2015 – 02/2016 | Taipei, Taiwan

- Implemented DCT Algorithm IC design.

Research and Development Intern

Mediatek

07/2015 – 08/2015 | Taipei, Taiwan

- Conducted IC design environment testing and compiler integration.

Publications

Journal

1. **Wang, C.Y.**, Sadrieh, F.K., Shen, Y.T., Oppizzi, G., Zhang, L.Q. and Tao, Y., (2025). EgoFall: Real-time Privacy-Preserving Fall Risk Assessment with a Single On-Body Tracking Camera. *IEEE Transactions on Neural Systems and Rehabilitation Engineering (IEEE TNSRE)*.

2. **Wang, C. Y.**, Nandhan, A. G., Shen, Y. T., Chen, W. Y., Kumar, S. S. S., Long, A., … & Tao, Y. (2024). ShellCollect: A Framework for Smart Precision Shellfish Harvesting Using Data Collection Path Planning. *IEEE Access*.

3. **Wang, C.Y.**, Sadrieh, F.K., Shen, Y.T., Chen, S.E., Kim, S., Chen, V., Raghavendra, A., Wang, D., Saeedi, O. and Tao, Y., 2024. MEMO: dataset and methods for robust multimodal retinal image registration with large or small vessel density differences. *Biomedical Optics Express*, *15*(5), pp.3457-3479.

4. Chen, S. C., Wu, P. C., **Wang, C. Y.**, & Kuo, P. L. (2020). Evaluation of cytotoxic T lymphocyte-mediated anticancer response against tumor interstitium-simulating physical barriers. Scientific reports, 10(1), 1-13.

5. Sun, C. K., Wu, P. J., Chen, S. T., Su, Y. H., Wei, M. L., **Wang, C. Y.**, … & Liao, Y. H. (2020). Slide-free clinical imaging of melanin with absolute quantities using label-free third-harmonic-generation enhancement-ratio microscopy. *Biomedical Optics Express*, 11(6), 3009-3024.

6. **Wang, C.Y.**, Kao, T.C., Chen, Y.F., Su, W.W., Shen, H.J. and Sung, K.B., 2019, May. Validation of an inverse fitting method of diffuse reflectance spectroscopy to quantify multi-layered skin optical properties. In *Photonics* (Vol. 6, No. 2, p. 61). MDPI.

7. Tsui, S.Y., **Wang, C.Y.**, Huang, T.H. and Sung, K.B., 2018. Modelling spatially-resolved diffuse reflectance spectra of a multi-layered skin model by artificial neural networks trained with Monte Carlo simulations. *Biomedical optics express*, 9(4), pp.1531-1544.

Conference Proceeding (All peer-reviewed)

8. Shen, Y. T.*, Eum, S.*, Lee, D., Shete, R., **Wang, C. Y.**, Kwon, H., & Bhattacharyya, S. S. (2025). AutoComPose: Automatic Generation of Pose Transition Descriptions for Composed Pose Retrieval Using Multimodal LLMs. *The IEEE/CVF International Conference on Computer Vision (**ICCV**), 2025*

9. **Wang, C.Y.**, Sadrieh, F.K., Shen, Y.T., Oppizzi, G., Zhang, L.Q. and Tao, Y., 2024, April. Real-Time Privacy-Preserving Fall Risk Assessment with a Single Body-Worn Tracking Camera. *The ICASSP 2024-2024 IEEE International Conference on Acoustics, Speech and Signal Processing* (**ICASSP**) (pp. 1866-1870). IEEE.

10. **Wang, C.Y.**, Hevaganinge, A., Wang, D., Ali, M., Cattaneo, M. and Tao, Y., 2021, November. Prediction of aqueous glucose concentration using hyperspectral imaging. *The 2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC) (pp. 3237-3240). IEEE*.

11. **Wang, C.Y.**, Lin, T.X. and Sung, K.B., 2018, September. Improved Inverse Two-Layered Monte Carlo Fitting of In-vivo Skin Diffuse Reflectance Spectra. In Laser Science (pp. JW3A-121). Optica Publishing Group.

12. **Wang, C.Y.**, Yu, T.W. and Sung, K.B., 2018, February. In vivo measurements of optical properties of human muscles with visible and near infrared reflectance spectroscopy. In Optical Biopsy XVI: Toward Real-Time Spectroscopic Imaging and Diagnosis (Vol. 10489, pp. 58-63). SPIE.

13. **Wang, C.Y.**, Liao, A.Y.C. and Sung, K.B., 2018, February. Developing visible and near-infrared reflectance spectroscopy to detect changes of the dermal collagen concentration. In Optical Biopsy XVI: Toward Real-Time Spectroscopic Imaging and Diagnosis (Vol. 10489, pp. 124-131). SPIE.

14. **Wang, C.Y.**, Yu, T.W., Sung, K.B., "Sensitivity Analysis for Detecting Oxygen Saturation of Deep Veins with Non-invasive Near Infrared Spectroscopy," IEEE EMBC 2017

Awards & Honors

- Chang Kuan Liang Scholarship, Taiwanese Society of Biomedical Engineering   03/2018
- College Student Research Scholarship, Ministry of Science and Technology, R.O.C.   07/2015