

Chiao-Yi Wang

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RESEARCH INTERESTS

Medical Imaging / Computer Vision / Machine Learning / Biomedical Signal Processing / Bio-photonics

EDUCATION

University of Maryland, College Park

College Park, MD, USA

- Ph.D., Graduate Fischell Department of Bioengineering
- Advisor: Prof. Yang Tao

Aug. 2020 - Present

National Taiwan University

Taipei, Taiwan

- M.S., Graduate Institute of Biomedical Electronics and Bioinformatics
- Advisor: Prof. Kung-Bin Sung

Sep. 2016 - June, 2018

National Taiwan University

Taipei, Taiwan

- B.S., Electrical Engineering

Sep. 2012 - June, 2016

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*.
- [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. *Submitted*.

- [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. In 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. In 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

RESEARCH EXPERIENCE

Bio-Imaging and Machine Vision lab, University of Maryland

College Park, MD, USA

Research Assistant

Aug. 2020 - Present

Advisor: Prof. Yang Tao

- Developed a deep learning-based computer vision system to identify direction-specific instability patterns for fall risk assessment [1][9]
- Developed a deep learning-based computer vision method to measure 4D erythrocyte flow rates in the retina [3]
- Proposed a framework for smart precision shellfish harvesting using data collection path planning [2]
- Designed an in-line, self-calibrating glucose monitoring system using hyperspectral imaging and deep learning [10]

Biomedical Optical Spectroscopy and Imaging lab, National Taiwan University

Taipei, Taiwan

Research Assistant

Sep. 2016 - Aug. 2018

Advisor: Prof. Kung-Bin Sung

- Developed a non-invasive bio-optical method to detect oxygen saturation of deep veins [12][14]
- Developed a multi-wavelength optical system to detect the change of dermal collagen concentration in real time [6][11][13]
- Analyzed bio-optical imaging of skin melanin concentration using non-invasive bio-optical method [5][7]

Cellular Mechanism and Biophysics lab, National Taiwan University

Taipei, Taiwan

Undergraduate Research

July 2014 - Feb. 2016

Advisor: Prof. Po-Ling Kuo

- Developed a tumor interstitium-mimicking platform for evaluation of cytotoxic T lymphocyte-mediated killing of tumor cells [4]

Lab for Data Processing Systems, National Taiwan University

Taipei, Taiwan

Undergraduate Research

Sep. 2015 - Feb. 2016

Advisor: Prof. Yi-Chang Lu

- Implemented DCT Algorithm IC design

WORKING and TEACHING EXPERIENCE

Bioimaging Class(BIOE420), UMD*Teaching Assistant*

College Park, MD, USA

Sep. 2021 - Dec. 2021

IBM*IT Specialist*

Hsinchu, Taiwan

Sep. 2018 – June 2020

- Develop IBM SiView RTD (Real Time Dispatcher) and data migration tool
- TSMC MES system maintenance project

Optical Techniques in Diagnosis Class, NTU*Teaching Assistant*

Taipei, Taiwan

Feb. 2018 - June. 2018

Biomedical Optical Spectroscopy and Imaging Techniques Class, NTU*Teaching Assistant*

Taipei, Taiwan

Sep. 2017 - Jan. 2018

Student Service Education Class, NTUEE*Teaching Assistant*

Taipei, Taiwan

Feb. 2017 - June 2017

Mediatek*R&D Intern*

Taipei, Taiwan

July 2015 - Aug. 2015

- IC design environment testing, including library preparation and IC Compiler

AWARD & HONORS

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

SKILLS**Programming**

- Python, PyTorch, OpenCV, C/C++, MATLAB, Javascript, SQL, LaTeX, CUDA, DB2, Verilog

Languages

- Mandarin (Native), English (Fluent)