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 Aug. 2020 - Present
  - Advisor: Prof. Yang Tao

National Taiwan University Taipei, Taiwan
- M.S., Graduate Institute of Biomedical Electronics and Bioinformatics Sep. 2016 - June, 2018
  - Advisor: Prof. Kung-Bin Sung

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 (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

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 College Park, MD, USA
Teaching Assistant Sep. 2021 - Dec. 2021

IBM Hsinchu, Taiwan
IT Specialist 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 Taipei, Taiwan
Teaching Assistant Feb. 2018 - June. 2018

Biomedical Optical Spectroscopy and Imaging Techniques Class, NTU Taipei, Taiwan
Teaching Assistant Sep. 2017 - Jan. 2018

Student Service Education Class, NTUEE Taipei, Taiwan
Teaching Assistant Feb. 2017 - June 2017

Mediatek Taipei, Taiwan
R&D Intern 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)