Yuwei Yang

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EDUCATION BACKGROUND

Fudan University Shanghai, China / Sep.2022-Jun.2025 (Expected)
Master of Electronic information **GPA:3.68/4**

Wuhan University Wuhan, China / Sep.2018 - June.2022
Bachelor of Optoelectronic information science and engineering **GPA:3.25/4 (Top 30%)**

ACADEMIC PAPERS

[1] **Yuwei Yang**, et al., Deep learning model utilizing fluorescence lifetime imaging microscopy and confidence learning for predicting endometrial cancer risk, Optics & Laser Technology, Volume 181, Part A, 2025, 111620, ISSN 0030-3992, https://doi.org/10.1016/j.optlastec.2024.111620.

[2] W.Su, D.Zheng, J.Zhou, Q.Chen; L.Chen, **Y.Yang**, et al., Rapid and precise multifocal cutaneous tumor margin assessment using fluorescence lifetime detection and machine learning, APL Photonics 9, 096107 (2024), https://doi.org/10.1063/5.0224181

RESEARCH EXPERIENCES

Deep learning model utilizing fluorescence lifetime imaging microscopy (FLIM) and confidence learning for predicting endometrial cancer risk

Core member Oct.2022~Aug.2024

- Used viscosity-sensitive fluorescent probe (DCVJ) to stain minimally invasive exfoliation cytology specimens with different pathologies.
- Used FLIM (single-photon and two-photon) to capture viscosity characteristics and morphology of the samples, suggested difference of intracellular viscosity between malignant and benign samples.
- Completed image processing, cell segmentation and data augmentation. A total of 2348 FLIM images were collected from 42 individuals for training purposes.
- Employed a deep learning model ResNeSt50 combined with confidence learning as a strategy to identify and mitigate the impact of label errors, and optimized the dataset for training.
- Achieved sensitivity of 84.6% and specificity of 75.0% in predicting endometrial cancer risk.

Detection of gynecological cancer by FLIM combined with machine learning

Core member Aug.2024~till now

- Obtained fluorescence lifetime images of exfoliated cervical cell samples from LBC test liquid, and analyzed the intracellular metabolic changes.
- Employed AlexNet network to extract features of FLIM images. Applied principal component analysis (PCA) and t-distributed stochastic neighbor embedding (t-SNE) to visualize the distribution of high-dimensional features.

Study on human pancreatic tissue and ex vivo islets to identify the metabolic difference in various conditions

Team member Sep.2024~till now

- Obtained autofluorescence lifetime images of pancreatic tissue and ex vivo islets to evaluate the contribution of protein- bound NAD(P)H, and analyzed the difference among ages.

- Employed neural network to automatically outline the islets and tag the images. Identify the difference between diabetics and normal people by the size of islets.

Study on algorithm of particle image velocimetry based on 2 dimensions ultrasonic images in turbid water flow

Team member Sep.2021~May.2022

- Combined with multistage iterative window grid deformation algorithm to deform and adjust the size of the inquiry window multiple times according to the water flow velocity.
- Divided images into multiple grids, used cross-correlation method based on FFT to match the grids of 2 sequential ultrasound particle images. Calculated the location of the cross-correlation peak, and simulate the particle displacement vector.

Rapid and precise multifocal cutaneous tumor margin assessment using fluorescence lifetime detection and machine learning

Team member Sep.2022~Aug.2023

- Employed a machine learning model to refine labels of fluorescence lifetime images of surgical excision tissue samples (With extramammary Paget's disease (EMPD)).
- Developed a support vector machine (SVM) model using fiber-optic-based multi-channel autofluorescence lifetime decay (MALD) data and these refined labels. The MALD-SVM model successfully validates the entire surgical margin of another EMPD case.

Additional Experience

Volunteer in the International Workshop on Quantum Computing and Nanophotonics May.2024

- Responsible for reception work for invited foreign professor. Attended the workshop.

Summer camp of Fudan University Jul.2021

- Honored to be an excellent camper of summer camp, and received the recommended direct admission of graduate program of Fudan University.

General Practice of Photoelectric System Jul.2021

- Studied in Huazhong Yangtze River Optical-Electronic Technology Company about optical lens manufacturing, optical instrument manufacturing process.

HONORS & AWARDS

Second Prize, Academic Scholarship for Postgraduate Studies, Fudan University 2023
Honored Award for Outstanding Graduate, Wuhan University 2022
Honorable Prize, Mathematical Contest In Modeling 2020
Third Prize, Academic Scholarship for Undergraduate Studies, Wuhan University 2020

SKILLS & LANGUAGES

- Optical experiment: FLIM based on confocal fluorescence microscope; FLIM data fitting based on SPCImage (Becker & Hickl, Germany) for the Olympus microscope, and LAS X (Leica Microsystems, Berlin, Germany) for the Leica microscope.
- Biological experiment: Cell culture; Basic operations including staining and centrifugation.
- Professional software: MATLAB, Spyder, Origin, ImageJ
- Languages: Mandarin (Native), English (TOEFL:102)