Jiatao **Yan**

AI Postgraduate Student with a Focus on Computer Vision & Medical AI

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Education

Sussex Artificial Intelligence Institute, Zhejiang Gongshang University

Hangzhou, China

Master in Artificial Intelligence and Adaptive System — *Sept 2024 – Jan 2026 (Expected)*

- Thesis Focus: Integrating physics-informed models into a Variational Autoencoder (VAE) framework to enhance the interpretability of the latent space.
- Core Courses: Image Processing, Natural Language Processing, Machine Learning, Intelligence in Animals and Machines, Intelligent Systems Techniques, Python Programming.

Wenzhou Business College

Wenzhou, China

B.S. in Computer Science and Technology — *Sept 2019 – June 2023*

- GPA: 3.41/5.0 (Equivalent to 84.7/100)
- Core Courses: Data Structures and Algorithms, Python Programming, Data Analysis, Machine Learning.
- Undergraduate Thesis: Smoking Behavior Detection Based on Deep Learning and Skeletal Frameworks.

Research & Internship Experience

First Affiliated Hospital of Wenzhou Medical University

Wenzhou, China

Research Intern — *Sept 2022 – Jan 2023*

- Independently developed medical image preprocessing software for clinical use, leading to a registered software copyright (2022SR0252378).
- Contributed to the development of a deep learning model for leukemia diagnosis using tongue image analysis.
- Designed and implemented machine learning algorithms for exosome feature analysis in hepatocellular carcinoma research.

National Innovation Training Program for University Students

Wenzhou, China

Project Lead — *June 2022 – June 2023*

- Led a team to research and develop a YOLO-based architecture enhanced with attention mechanisms for real-time object detection.
- Managed the project lifecycle, from technical development and experimental validation to intellectual property applications.

Publications

Machine Learning Identifies Exosome Features Related to Hepatocellular Carcinoma

Published in *Frontiers in Cell and Developmental Biology* — *Sept 2022*

- Authors: Kai Zhu, Qiqi Tao, ***Jiatao Yan***, Zhichao Lang, Xinmiao Li, Yifei Li, Congcong Fan, Zhengping Yu
- DOI: 10.3389/fcell.2022.1020415
- Contribution (Co-first author, 3rd): Developed ML algorithms for exosome feature analysis and classification.

Multi-omics and Machine Learning-driven CD8+ T Cell Heterogeneity Score for Prognosis

Published in *Molecular Therapy Nucleic Acids* — *Dec 2024*

- Authors: Di He, Zhan Yang, Tian Zhang, Yaxian Luo, Lianjie Peng, ***Jiatao Yan***, et al.
- DOI: 10.1016/j.omtn.2024.102413
- Contribution: Implemented various ML algorithms for key gene identification in HNSCC research.

Using Multiomics and Machine Learning: Insights into Improving the Outcomes of Clear Cell Renal Cell Carcinoma via the SRD5A3-AS1/hsa-let-7e-5p/RRM2 Axis

Published in *ACS Omega* — *June 2025*

- Authors: Mouyuan Sun, Zhan Yang, Yaxian Luo, Luying Qin, Lianjie Peng, Chaoran Pan, ***Jiatao Yan***, Tao Qiu, Yan Zhang
- DOI: 10.1021/acsomega.5c01337
- Contribution: Implemented ML algorithms to identify important features of the SRD5A3-AS1/hsa-let-7e-5p/RRM2 axis.

Manuscripts in Preparation

YOLOv11-LCDFS: Enhanced Smoking Detection With Low-light Enhancement

In Preparation

- Authors: ***Jiatao Yan***, Zhuzikai Zheng, Zhengtan Yang, Hao Jiang, Peichen Wang, Fangjun Kuang, Siyang Zhang
- Contribution (First author): Developing a YOLO-based architecture integrating low-light enhancement, custom loss functions, attention mechanisms, and optimized upsampling to improve detection in varied lighting.

Deep Learning Model for Survival Prediction of Localized Upper Tract Urothelial Carcinoma Based on Multi-Phase CT Images and Clinical Data

In Preparation

- Authors: Kai Zhu, Binwei Lin, ***Jiatao Yan***, Honghui Zhu, Wei Chen, Xin Yao, Fengyan You, Yue Pan, Feng Wang, Peng Xia, Yeping Li, Lianguo Chen, Zhixian Yu, Shouliang Miao, Xiaomin Gao
- Contribution (Co-first author, 3rd): Designing the deep learning architecture for multi-phase CT analysis and developing methods to fuse imaging features with clinical data for a comprehensive predictive model.

Selected Projects

Personal Project

Multi-modal 3D Medical Image Segmentation

- Developed a complete pipeline for processing multi-modal medical data (NIFTI), including intensity normalization and multi-mask merging.
- Implemented and benchmarked multiple 3D segmentation architectures: 3D U-Net, Swin-UNETR, TransUNet, and DeepLabV3+.
- Engineered a data matching system for spatio-temporal alignment of T2 and DWI images and designed a 3D-to-2D slicing workflow.

Personal Project

Deep Learning-based Disease Detection System

- Enhanced YOLOv8 feature extraction by integrating a suite of attention mechanisms (GAM, CBAM, ECA) and advanced upsampling techniques (CARAFE, DySample).
- Designed and validated custom loss functions, including Triplet, Inner-CIoU, and Focus Loss, to optimize object detection performance in clinical scenarios.

Personal Project

Airline Twitter Sentiment Analysis

- Designed a text preprocessing pipeline for Twitter data and implemented two distinct classification models: a Naive Bayes classifier with CountVectorizer and a bi-layer LSTM network for sentiment prediction.

Personal Project

Airbnb Price Analysis and Prediction

- Performed exploratory data analysis and geospatial visualization on 49,000 NYC listings using GeoPandas to reveal price distribution patterns. Compared Random Forest and a Keras-based DNN for price prediction.

Personal Project

Heart Disease Prediction System

- Identified key predictive factors for heart disease through feature engineering and compared the performance of various classification algorithms, including K-Nearest Neighbors, SVM, Random Forest, and Naive Bayes.

Academic Achievements

Apr 2025	**Ranked 116th/3310 (Top 4%),** Predict Podcast Listening Time	*Kaggle Competition*
May 2025	**Ranked 178th/4316 (Top 5%),** Predict Calorie Expenditure	*Kaggle Competition*
May 2025	**Bronze Medal, Ranked 143rd/1516 (Top 10%),** Stanford RNA 3D Folding	*Kaggle Competition*
May 2025	**Ranked 315th/1136 (Top 28%),** BYU - Locating Bacterial Flagellar Motors 2025	*Kaggle Competition*
June 2025	**Ranked 255th/1365 (Top 19%),** Yale/UNC-CH - Geophysical Waveform Inversion	*Kaggle Competition*
Sept 2022	**Ranked 441st/1174 (Top 38%),** HuBMAP + HPA - Hacking the Human Body	*Kaggle Competition*
May 2023	**Bronze Medal,** 18th "Challenge Cup" Provincial College Student Competition	*Zhejiang Province*

Patents & Intellectual Property

Invention Patent, Smoking Behavior Recognition Camera and Method	*No. 202310277784.1*
Software Copyright, Medical Image Computing Software	*2022SR0252378*
Software Copyright, Human Skeleton Recognition Software	*2022SR1258998*
Software Copyright, Cigarette Recognition Software	*2022SR1277520*
Software Copyright, Smoking Behavior Detection Software	*2022SR1277521*

Technical Skills

Languages	Python, SQL, Java, C, C#, JavaScript
Frameworks	PyTorch, TensorFlow, Keras, Scikit-learn, Pandas, NumPy, OpenCV, Vue.js
Tools	Git, Docker, LaTeX, GeoPandas, Matplotlib, Seaborn
Languages	Mandarin (Native), English (IELTS 6.0(Listening: 6.5, Reading: 6.5, Writing: 5.5, Speaking: 6.0), CET6)