

# WEI Lan

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## EDUCATION BACKGROUND

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### University of Science and Technology of China

09/2021-Present

- Major: Master of Engineering in Computer Science and Technology
- Advisor: Prof. Nikolaos M. Freris.
- Core Modules: Graph Theory, Optimization, Combinatorial Mathematics, Algorithm Design and Analysis, Advanced Artificial Intelligence, Advanced Software Engineering, Advanced Quantum Computing

### Xiamen University

09/2017-06/2021

- Major: Bachelor of Engineering in Computer Science and Technology
- GPA: 3.87/4.0 (Top 3%, Ranking: 2/61)
- Thesis: "Skin Lesion Segmentation: A Boundary-aware Transformer-based Solution"
- Core Modules: C++, MATLAB, UNIX, Data Structure, Numerical Methods, Digital Logic, Operating System, Computer Architecture, Compiler Principle, Computer Networks, Software Architecture and Development Environment

## RESEARCH EXPERIENCE

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### Physics-informed GNN for Computer Graphics, AIoT Lab, USTC, China

09/2022-03/2023

- Publish a paper - Multi-scale Graph Neural Network for Physics-informed Fluid Simulation in Computer Graphics International (CGI'23) conference as the first author.
- Addressed the issue of over-smoothing in graph neural networks for learning-based fluid simulation.
- Modeled fluid flow via graphs at different scales in succinct consideration of scalability and physical constraints.
- Proposed a novel multi-scale GNN for physics-informed fluid simulation (MSG) by introducing a non-parametric sampling and aggregation method to combine features from graphs with different resolutions.
- Achieve the SOTA in both one-step and long trajectory fluid simulation with the lowest model inference time.

### Transformer-based Medical Image Segmentation, Xiamen Manteia Data Technology Co., Ltd, China

09/2020-03/2021

- Published an article-Boundary-aware Transformers for Skin Lesion Segmentation in MICCAI'21 conference as the first author.
- Addressed the challenging of segmenting ambiguous boundaries of skin lesion melanoma area.
- Proposed a novel network architecture that integrate a new boundary-wise attention gate (BAG) into transformer architecture to enable the whole network to not only effectively model global long-range dependencies via transformers but also, simultaneously, capture more local details by making full use of boundary-wise prior knowledge.
- Achieve the SOTA in two famous public datasets.

### Volume Prediction of Ellipsoidal Ham, CACV Lab, FCU, Taiwan

11/2018-09/2020

- Published an article-A Statistical Approach in Enhancing the Volume Prediction of Ellipsoidal Ham in Journal of Food Engineering (SCI Q1, Impact Factor: 6.203) as the second author
- Applied Mask-RCNN to process images of the research object, analyzed the value of major axis, minor axis, extreme points and object orientation of ellipsoidal ham with MATLAB boxplot and got the position of irregular images
- Worked out the actual volume of the object with its pixel value using the conversion rate after adjusting irregular images
- Applied quadratic polynomial and power function build to conversion rate model of the results
- Acquired four parameters of the model using LOOO

## INDUSTRY EXPERIENCE

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### Huawei Research Project

01/06/2022-Present

- Participate in designing the graph compression algorithm for large special Graphs.
- Implantate it in C++.

**Tencent Game 2022 Engine & Graphics Research Project****01/09/2022-30/12/2022**

- This is a three-month research program to optimize the rendering pipeline in Unreal Engine 4 for mobile device rendering.
- Implemented a dynamic weather system, including atmospheric scattering, volumetric clouds, precipitation, and interactive water surfaces, using deferred rendering techniques.
- Rendering the scene smoothly at 30 frames per second on Android devices with Snapdragon 835 chips, while keeping the GPU load below 70%.

**2020 Next Exceptional X Talent Program****01/07/2020-29/08/2020**

- The program is a 60-day intensive summer boot camp with a collection of Googler coaching sessions and online training
- Attended training sessions in computer algorithm, programming, software development, leadership training

**Financial Data Analyst, Huawei Technology Co., Ltd., Chengdu Research Institute****07/2019-10/2019**

- Conducted visual analysis of financial data using MATLAB and Power BI, and built dynamic mathematical model
- Calculated the proportion of total annual expense in overall budget, compared monthly and quarterly expense with the budget, did parallel comparison of spending for various modules, made prediction about future cost and gave warnings based on performance of the current year
- Hosted Commendation Conference of Suppliers for the first half of 2019

**TEACHING**

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- **COMP6224P: Optimization Theory**  
Teaching Assistant, USTC, Spring 2023
- **COMP6209P: Queuing Theory and Its Application in Computer Networks**  
Teaching Assistant, USTC, Fall 2022

**HONORS AND AWARDS**

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- First-class Scholarship, University of Science and Technology of China (2020-2021 and 2021-2022)
- National First Prize in the 11th China Adolescents Science and Technology Innovation Contest
- First-class Scholarship, Xiamen University (3%, 2019-2020)
- Second-class Scholarship, Xiamen University (10%, 2018-2019)
- The Highest score in Malaysia, Simon Marais Asia-Pacific Mathematics Competition (2018.10)

**ADDITIONAL INFORMATION**

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**Language Skills:** Mandarin (native), English (fluent)**Hobbies:** photography, film, hiking and playing badminton