

# Wenhao Tang

## PERSONAL INFORMATION

M/F : Male                                      **Degree** : Master                                      **Tel** : +86 177-8475-0069  
**D.O.B.** : 28/10/1998                                      **Email** : [whtang@cqu.edu.cn](mailto:whtang@cqu.edu.cn)                                      **Homepage** : [www.whtang.cn](http://www.whtang.cn)  
**Add.** : Room 531, School of Big Data & Software Engineering, Chongqing University, China, 401331.

## EDUCATION BACKGROUND

Chongqing University	Master's Degree	Chongqing, CHN	Sept. 2021 - Present
<b>Major</b> : Software Engineering		<b>GPA</b> : 88.8/100	
<b>Core Modules</b> :	Algorithm Analysis & Design	Software System Architecture	Advanced Machine Learning
	Intelligent Software Engineering	Edge Computing & Network Optimization	Graph Theory
Chongqing University	Bachelor's Degree	Chongqing, CHN	Sept. 2017 - Jun. 2021
<b>Major</b> : Software Engineering		<b>GPA</b> : 3.2/4.0 ( <b>Professional GPA</b> : 3.6)	
<b>Core Modules</b> :	Linear Algebra	Advanced Mathematics	Probability Theory & Mathematical Statistics
	Discrete Mathematics	Data Structure and Algorithm	Machine Learning & Pattern Recognition



## FIELDS OF INTEREST

- **Image Classification** : High-resolution and Fine-grained Image Classification; Medical Image Classification;
- **Transformer** : Vision Transformer; Efficient Transformer; Position Encoding;
- **Weakly-supervised Learning** : Multiple-instance Learning; Weakly Supervised Object Detection;
- **Self-supervised Learning** : Contrastive Learning; Masked Image Modeling; Knowledge Distillation;

## PUBLICATIONS

- **Wenhao Tang**, Sheng Huang, Xiaoxian Zhang, and Luwen Huangfu. "PicT: A Slim Weakly Supervised Vision Transformer for Pavement Distress Classification" *Proceedings of the 30th ACM International Conference on Multimedia*, 3076-3084. 2022.  
- Sheng Huang, **Wenhao Tang**, Guixin Huang, Luwen Huangfu, and Dan Yang. "Weakly Supervised Patch Label Inference Networks for Efficient Pavement Distress Detection and Recognition in the Wild" *IEEE Transactions on Intelligent Transportation Systems*. 2023.  
- **Wenhao Tang**, Sheng Huang, Qiming Zhao, Ren Li, and Luwen Huangfu. "An Iteratively Optimized Patch Label Inference Network for Automatic Pavement Distress Detection" *IEEE Transactions on Intelligent Transportation Systems* 23 (7), 8652-8661. 2021.  
- Shizheng Zhang, **Wenhao Tang** (equally contribution with Shizheng Zhang), Jing Wang, and Sheng Huang. "Efficient pavement distress classification via deep patch soft selective learning and knowledge distillation" *Electronics Letters* 58 (18), 693-695. 2022.  
- Tao He, Sheng Huang, **Wenhao Tang**, and Bo Liu. "Deformable Kernel Expansion Model for Efficient Arbitrary-shaped Scene Text Detection" *arxiv*. 2023. 
- **Wenhao Tang**, Sheng Huang, Xiaoxian Zhang, Fengtao Zhou, Yi Zhang, and Bo Liu. "R<sup>2</sup>T-MIL: Re-embedded Regional Transformer based Multiple Instance Learning for Whole Slide Image Classification" *ICCV 2023 Under review*. 2023. (Refer to the attachment.)
- **Wenhao Tang**, Sheng Huang, Xiaoxian Zhang, Fengtao Zhou, Yi Zhang, and Bo Liu. "Multiple Instance Learning Framework with Masked Hard Instance Mining for Whole Slide Image Classification" *ICCV 2023 Under review* 2023. (Refer to the attachment.)

## RESEARCH PROJECTS

- **Project** : Automated Pathology Image Diagnosis based on Whole Slide Images (WSIs)  
*National Natural Science Foundation of China* Jun. 2022-Present  
**Advisor** : Associate Prof. Sheng Huang Chongqing University  
**Task 1** : With the **Transformer-based feature re-embedding** module, we propose a **new multi-instance learning paradigm** for WSI classification.  
**Task 2** : Proposing a **masked hard instance mining framework** with **contrastive learning** to alleviate the dependence of state-of-the-art algorithms on salient patches.
- **Project** : Automatic Pavement Distress Classification   
*Research Project Cooperated with Company* Feb. 2020 - Present  
**Advisor** : Associate Prof. Sheng Huang Chongqing University  
**Task 1** : With a **large-scale bituminous pavement distress detection dataset** (CQU-BPDD), we propose an automated computer vision-based **pavement distress classification task**.  
**Task 2** : With the **EM-based iterative optimization** algorithm, we propose a patch label inference network for automatic pavement distress detection.  
**Task 3** : Proposing a **weakly supervised end-to-end** framework for efficient pavement distress classification.  
**Task 4** : Introducing **multi-instance learning** and **self-distillation** technology to facilitate distress classification.  
**Task 5** : Introducing **vision Transformer** and **self-supervised learning** to improve classification performance and efficiency.
- **Other Projects**
  - **Arbitrary Shaped Scene Text Detection** Sep. 2022 - Present  
Expanding text kernels at contour level to obtain precise text location information more efficiently.
  - **High-level Computer Vision Training Framework based on Pytorch**  Sep. 2021 - Present  
Building a deep learning training framework based on pytorch and timm to reproduce different algorithms more fairly and easily.

## PROFESSIONAL EXPERIENCE

- **Teaching**
  - **Teaching Assistant** Deep Learning Chongqing University Sept. 2022 - Dec. 2022
  - **Teaching Assistant** Machine Learning Chongqing University Apr. 2022 - Jun. 2022
  - **Teaching Assistant** Deep Learning Chongqing University Sept. 2021 - Dec. 2021
- **Conference Attending**
  - The Thirtieth ACM International Conference on Multimedia (MM 2022) Virtual, Online Oct. 2022
  - The Tenth Vision and Learning Seminar (Valse 2021) Hangzhou, China Oct. 2021
- **Talks/Presentations**
  - **Subject** : Vision Transformer and Self-supervised Learning  
Center for Intelligence and Software Engineering, Chongqing University Oct. 2021
  - **Subject** : PicT: A Slim Weakly Supervised Vision Transformer for Pavement Distress Classification  
Thirtieth ACM International Conference on Multimedia, Virtual, Online Oct. 2022
- **Review**
  - The Thirty-sixth Conference on Neural Information Processing Systems Jul. 2022
  - The European Conference on Computer Vision May. 2022
  - The IEEE/CVF Conference on Computer Vision and Pattern Recognition Jan. 2022
  - The Thirty-sixth AAAI Conference on Artificial Intelligence Nov. 2021
  - The Thirty-second British Machine Vision Conference Jul. 2021

## TECHNICAL SKILLS

<b>Programming Language</b>	Python, C++, C, Java, Bash, LATEX, C#, HTML, JavaScript
<b>Operating System</b>	Debian, Ubuntu, Windows, Windows Subsystem for Linux
<b>Framework &amp; Library Pytorch</b>	Pytorch, Tensorflow, Keras, Timm, Numpy, Matplotlib, Pandas