Wenhao Tang

PERSONAL INFORMATION

M/F : Male **Degree** : Master **Tel** : +86 177-8475-0069
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EDUCATION BACKGROUND

Chongqing University	Master's Degree	Chongqing, CHN	*Sept. 2021 - Present*

Major : Software Engineering **GPA** : 88.8/100

Core Modules : 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*

Major : Software Engineering **GPA** : 3.2/4.0 (**Professional GPA**: 3.6)

Core Modules : 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^2T-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

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