

XIAOCHEN MA

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🎓 EDUCATION

Sichuan University, *B.E. in Computer Science*

Chengdu, China

Percentage Grade: 87.167 / 100

Sep. 2019 – June. 2023

- Outstanding Undergraduate Thesis Award. (Top 2 of 400+ students)
- Visiting student to **National University of Singapore** in June. 2022

📄 PUBLICATIONS (* MARKS THE MENTOR)

- J.Z. Zhou*, **X.C. Ma**, X. Du, A. Y. Alhammedi, W.T Feng. *Pre-training-free Image Manipulation Localization through Non-Mutually Exclusive Contrastive Learning*. **ICCV 2023**. (June. 2023)
- **X.C. Ma**, B. Du, Z.H. Jiang, A. Y. Alhammedi, J.Z. Zhou*. *IML-ViT: Benchmarking Image Manipulation Localization by Vision Transformer*. **Under Review, AAAI 2024**. (Jul. 2023)
- **X.C. Ma**, J.Z. Zhou*, X. Xu, Z.H Jiang, C.M Pun. *Perceptual MAE for Image Manipulation Localization: A High-level Vision Learner Focusing on Low-level Features*. **Under Review, TIFS**. (Sep. 2023)
- Z.Q. Ran, X.W Wang, L. Zhang, Y. Yang, Z.T. Shang, Q.F. Chen, **X.C. Ma**, Z.Q. Qian, W.B. Liu. *Enzymatic colorimetric method for turn-on determination of l-lactic acid through indicator displacement assay*. **Journal of Bioscience and Bioengineering**. (Jan. 2023)

📁 RESEARCH JOB

Full-time Research Assistant to Prof. Jizhe Zhou, DICA Lab

Chengdu, China

Colledge of Computer Science, Sichuan University

Jul. 2023- 2024 Jun. (expected)

- Primarily focused on research, conducted experiments, and authored research papers.
- Manage the allocation of servers, GPUs, and other computing resources within the laboratory.
- Provide technical and academic guidance to undergraduate and graduate students in the group.

📄 RESEARCH PROJECTS

A Survey on fighting against forgery images

Chengdu, China

Advisor: Prof. Jizhe Zhou. An RA work on going project.

May 2023- Oct. 2023

- Collaborate with Jizhe Zhou to lead a student team in completing a survey on the methods that could detect manipulated images and the generated images.
- Explore the possibilities of effectively detecting the content of generative models.

Perceptual Masked Autoencoder for Image manipulation localization

Chengdu, China

Advisor: Prof. Jizhe Zhou. RA Work outcomes. In submission to TIFS.

May 2023- Oct. 2023

- Building upon our prior project IML-ViT, I introduced an innovative approach that integrates hierarchical perceptual loss to enhance the Mean Absolute Error's (MAE) capacity in capturing low-level visual features.
- Conducted experiments that achieved SoTA performance on five benchmark datasets.

Benchmarking Image Manipulation Localization by Vision Transformer

Chengdu, China

Advisor: Prof. Jizhe Zhou. RA Work outcomes. In submission to AAAI24.

Dec. 2022- Sep. 2023

- We initially introduced the concept that high resolution, multi-scale, and boundary supervision constitute the three fundamental distinctions between Image Manipulation Localization and traditional semantic segmentation tasks. Building upon these insights, we developed IML-ViT, a Vision Transformer-based model, to empirically validate the significance of these differentiators.
- Through extensive experiments conducted on five publicly available datasets, our model consistently surpassed the SoTA benchmarks in terms of F1 scores, generalizability, and robustness. These results underscore the potential of our model to establish a new standard in this field.

Pre-training-free Image Manipulation Localization through Non-Mutually Exclusive Contrastive Learning

Chengdu, China

Advisor: Prof. Jizhe Zhou. Research intern. Accepted by ICCV23.

Jul. 2022- Mar. 2023

- We proposed the Non-mutually exclusive Contrastive Learning (NCL) framework to cope with the non-mutual image patches in Image Manipulation Localization, including manipulated, authentic and contour patches. Resolved the issue of traditional contrastive learning being limited to handling mutually exclusive elements. NCL both inherits the self-supervised merits to address the data insufficiency and retains a high manipulation localization accuracy.
- Extensive experiments verify that our NCL achieves state-of-the-art performance on all five benchmarks without any pre-training and is more robust on unseen real-life samples.

Machine Learning Model for Masked-Unmasked Face Recognition

Online

Summer workshop, School of Computing, National University of Singapore

Jun. 2022- Jul. 2022

- The course is taught, reported, and presented in full English.
- Led a team of four students in developing a model to match masked face images with unmasked faces, addressing a common need during the COVID-19 pandemic.
- Utilized traditional PCA and HOG methods for feature extraction, along with SVM for classification due to limited dataset.
- Achieved over 90% accuracy in results through 5-fold cross-validation.

Remote Sensing Image Interpretation Platform Based on PaddlePaddle

Chengdu, China

National second prize of "China Software Cup" competition

Apr. 2022-Jun. 2022

- Led a team of 4 members to build a web platform that can perform change detection, target extraction, feature classification, and target detection of remote sensing images.
- Responsible for reproducing the SOTA models(Deeplab V3+, PP-YOLO) with PaddlePaddle, a deep learning framework developed by Baidu. To improve the performance of the model, many pre-processing and post-processing tricks were applied to it, such as Test-Time-Augmentation and Morphology Operations.

LEADERSHIP EXPERIENCE

Covariant Innovation Computer Association of Sichuan University

Chengdu, China

President of a academic student association

Sep. 2021-Jun. 2022

- Conducted engaging lectures and classes outside of the regular curriculum to educate students on advanced C/C++ programming, which received positive feedback from students
- Guided a team in the development of specialized application software for school staff, focusing on creating an internet application using C++ that automatically managed classroom computer wallpapers
- Fostered a collaborative environment for open-source software development at Sichuan University.

HONORS AND AWARDS

Outstanding Undergraduate Thesis, Sichuan University. (Top 2 out of 400+ students)

Jun. 2023

Merit Student Award, Sichuan University

2019-2020

Comprehensive Second-class Scholarship, Sichuan University (Top 10%)

2020-2021

Single aspect First-class Scholarship, Sichuan University (Top 20 %)

2019-2020

National Second Prize in "China software cup" College Student Software Design Competition

Oct. 2022

SKILLS

- **Programming Languages:** C, C++, Python(PyTorch), \LaTeX , Java, HTML(Vue)
- **Language :** English - Fluent (IELTS 7.0, GRE 318), Mandarin - Native speaker