Chenrui Ma

+1-949-792-8518 | chenrum@uci.edu | cherry-Ma.com

Linkedin | Github | Google Scholar

Irvine, California - 92612, USA

Objective

Seeking a PhD position focused on generative and understanding models for real-world data (images, videos, 3D, and multi-modality). Motivated to address challenges in generation, understanding, reasoning, efficiency, and fairness. Aiming to contribute to innovative projects at the intersection of generative algorithms/models and practical problem-solving in domains such as scientific research and industrial applications.

Education

- **University of California, Irvine** — *September 2025 – June 2026*
  Master of Science in Computer Science (Networked Systems) — Irvine, California, USA
  ◦ GPA: 4.00/4.00
- **University of California, Irvine** — *September 2024 – June 2025*
  Exchange Student (UCI 3+2 Engineering program) in Computer Science — Irvine, California, USA
  ◦ GPA: 3.92/4.00
- **Central South University** — *September 2021 – June 2025*
  Bachelor of Science in Computer Science — Changsha, Hunan, China
  ◦ Grade: 86.8%, Rank: Top 35%

Experience

- **Trustworthy ML/AI Group @ UCI [🌐]** — *September 2024 – Present*
  Research Assistant — Irvine, California, USA
  ◦ Developed advanced algorithms and models for generative modeling, understanding, and reasoning, with applications in computer vision and vision-language models.
  ◦ Proposed novel generative theory/algorithms for efficiency (one-step generation, multi-stage generation).
  ◦ Designed methods to address challenges of fairness in generative models and representation learning.
- **Teaching Assistant @ UCI** — *January 2026 – March 2026*
  Paid — Irvine, California, USA
  ◦ Assist the professor with teaching and grading, and organize course discussions.
- **Oak Ridge National Laboratory [🌐]** — *May 2025 – Present*
  Student Collaborator (remote) — Oak Ridge, Tennessee, USA
  ◦ Engineered generative and understanding models with a focus on improving efficiency and performance.

Publications

C=Conference, J=Journal, S=In Submission

[C.1] **Chenrui Ma**, et al. (2025). **CAD-VAE: Leveraging Correlation-Aware Latents for Comprehensive Fair Disentanglement**. Accepted by *AAAI 2026 main track*.

[C.2] Xi Xiao, **Chenrui Ma**, et al. (2025). **PROBE: Self-Supervised Visual Prompting for Cross-Domain Road Damage Detection**. Accepted by *WACV 2026*.

[C.3] Yingrui Ji, **Chenrui Ma**, et al. (2025). **CIBR: Cross-modal information bottleneck regularization for robust clip generalization**. In *ICANN 2026*, pp. 247–259. Springer. 2025.

[S.1] **Chenrui Ma**, et al. (2025). **Learning Straight Flows: Variational Flow Matching for Efficient Generation**. Submitted to *CVPR 2026*.

[S.2] **Chenrui Ma**, et al. (2025). **Stochastic Interpolants via Conditional Dependent Coupling**. Submitted to *ICLR 2026*.

[S.3] **Chenrui Ma**, et al. (2025). **Beyond Editing Pairs: Fine-Grained Instructional Image Editing via Multi-Scale Learnable Regions**.

[S.4] Xi Xiao, **Chenrui Ma**, et al. (2025). **Prompting Vision Foundation Models with Cascaded Semantics** . Submitted to *CVPR 2026*.

[S.5] Xi Xiao, **Chenrui Ma**, et al. (2025). **Not All Directions Matter: Toward Structured and Task-aware Low-Rank Adaptation for Large-scale Model**. Submitted to *ACL 2026*.

[S.6] Zhuxuanzi Wang, **Chenrui Ma**, et al. (2025). **CTR-LoRA: Curvature-Aware and Trust-Region Guided Low-Rank Adaptation for Large Language Models**. Submitted to *ICASSP 2026*.

[J.1] Ding, Yingchao, **Chenrui Ma**, et al. (2024). **SCS-YOLO: a defect detection model for cigarette appearance**. *Electronics*, 13(18): 3761.

[J.2] Huang, Yueming, **Chenrui Ma**, et al. (2024). **Dense Object Detection Based on De-Homogenized Queries**. *Electronics*, 13(12): 2312.

PROJECTS

- **One-Step Generation Modeling (Flow/Diffusion)** *August 2025 – present (on-going)*
  Tools: Flow/Diffusion theory, Consistency Models, Mathematics
  ◦ Developed advanced one-step generation theory with proofs and analyses, together with corresponding algorithms and model parameterizations, enabling fast, stable, controllable, and robust one-step generation.
- **Enhance Efficiency and Performance for Generative Modeling (Flow/Diffusion)** *June 2025 – September 2025*
  Tools: Flow/Diffusion theory, Autoregressive Models, Mathematics [GitHub]
  ◦ Proposed multi-stage generation framework with conditional dependent coupling with theoretical proofs and analyses, demonstrating consistency between theoretical predictions and experimental results.
  ◦ Developed novel methods grounded in flow/diffusion theory to enhance efficiency and performance; achieved leading generation results on benchmark tasks, while maintaining scalability in efficient inference.
- **Instruction-driven Image Editing without Editing Pairs** *April 2025 – June 2025*
  Tools: Flow/Diffusion theory, Autoregressive Models, Multi-modality Models(CLIP)
  ◦ Leveraging supervision from VLMs that align textual and visual features, we train a flexible learnable region to localize the editing area and guide the editing process, achieving instruction-consistent image editing.
- **Enhance Fairness in Generative Modeling and Representation Learning** *September 2024 – March 2025*
  Tools: VAEs, Representation Learning, Information Theory, Mathematics [GitHub]
  ◦ Developed a conditional mutual information framework for representation learning, enabling robust and fairness-aware learning, and achieving both fairness and high performance in generative and downstream tasks.

SKILLS

- **Programming:** Python (PyTorch), JAX, Java, Matlab, C/C++, Web (HTML, CSS, JavaScript)
- **Mathematical & Statistical Tools:** Generative Methods (Flow/Diffusion, Autoregressive, VAEs, GANs), Algorithms (graduate-level), Information Theory, Linear Algebra
- **DevTool:** Git (version control system), Linux (operating system), Docker (containerization tool), Slurm (cluster management and job scheduling system)

HONORS AND AWARDS

- **AAAI-2026 Scholarship** *November 2025*
  Singapore
  ◦ Awarded to students with outstanding academic performance for the year.
- **University-level Second Prize Scholarship (Top 20%)** *September 2024*
  Central South University
- **University-level Third Prize Scholarship (Top 30%)** *September 2023*
  Central South University
- **21st China Undergraduate Mathematical Competition in Modeling** *September 2023*
  Changsha, Hunan, China
  ◦ National Second Prize, Top 15% nationwide.
- **4th National College Student Mathematical Modeling Competition** *July 2023*
  Changsha, Hunan, China
  ◦ National First Prize, Top 5% nationwide.

ACADEMIC SERVICES

- **Conference Reviewer:**
  CVPR 2026, AAAI 2026
- **Journal Reviewer:**
  npj Digital Medicine

REFERENCES

1. **Dr. Yanning Shen**
   Associate Professor, Department of EECS
   University of California, Irvine
   Email: yannings@uci.edu
   Relationship: Advisor, Thesis Supervisor, and Course Instructor
2. **Dr. Tianyang Wang**
   Assistant Professor, Department of Computer Science
   University of Alabama at Birmingham
   Email: tw2@uab.edu
   Relationship: Advisor
3. **Dr. Xiao Wang**
   research staff scientist, the Computational Science and Engineering Division
   Oak Ridge National Laboratory
   Email: wangx2@ornl.gov
   Relationship: Collaborator