

Yuning Chen

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RESEARCH INTERESTS

LLM Post-training, Agentic RL, Memory-aware reward modeling, Scalable RL systems with checkpointing.

PROFESSIONAL EXPERIENCE

Research Scientist @ Meta, Bellevue, WA

May. 2025 - Now

Core Research Project: MEMOIR: Disentangling Memory Deficiency from Execution Error in Agentic Reinforcement Learning

- Designed and implemented MEMOIR, a memory-aware credit-assignment framework for long-horizon tool-calling agentic RL that aligns the same step checkpoints across multiple rollouts and distinguishes failures caused by missing prerequisite information from those caused by incorrect reasoning or execution.
- Built a structured memory representation that converts intermediate observations and tool outputs into records containing the information type, entity, value, timestamp, and source step, allowing equivalent information to be matched across rollouts and traced to where it was acquired, stored, compressed, or retrieved.
- Ran controlled counterfactual rollouts from saved intermediate checkpoints by selectively removing or injecting candidate memory items, separating failures caused by memory insufficiency from those caused by action selection or execution. Routed the resulting credit to the responsible upstream memory operation or to the current reasoning and action step.

Product Launch: Self-evolving Oncall Automation Agent with Episodic and Procedural Memory

- Initiated and built a Qwen3-8B-based long-horizon tool-calling agent for root-cause analysis and automated remediation across 40+ alert types, each requiring 10+ diagnostic steps; reduced response time by over 60% and saved 520 engineering hours annually.
- Designed a two-tier experience-memory architecture: episodic memory captured incident context, tool calls, diagnostic decisions, outcomes, and supporting work-chat evidence; procedural memory consolidated recurring successful trajectories into reusable and retrievable debugging skills.
- Developed memory compression and consolidation policies to classify new incidents, deduplicate related experiences, identify novel failure patterns, and trigger skill induction for previously unseen alert categories; improved long-term task Pass@1 by 17.6%.
- Designed the post-training and eval framework, combining trajectory-level SFT with step-level agentic RL (HGPO w/ checkpoint-based rollout branching and reward assignment) over 42K trajectories, reducing reward hacking and improving Pass@1 by 5.9%.

Product Launch: Semantic Personalization for Lead Ads Quality

- Initiated and led the development and deployment of a Qwen3-4B-based pipeline to analyze Q&A in user-submitted lead forms and infer commerce intent. Leveraged RL post-training (GRPO) to enhance cross-answer analysis and attribution, combining rubric-based rewards with LLM-as-a-judge to mitigate reward hacking. Implemented a hierarchical KV cache to boost throughput by 545.9%.
- Drove production adoption by partnering with product teams to integrate the output as proxy labels for multi-task learning in the ads reranking teacher model. Improved normalized entropy by 1.96% and achieved a statistically significant production A/B-test win, increasing sanitized ads value by 11.6%.

Research Project: Generative Recommender as User Simulator for Ads Ranking Training Data Synthesis

- Defined the scientific formulation of generative recommenders as high-fidelity user behavior simulators, using SFT + GSPO-based RL post-training for stable long-sequence generation and new-user synthesis to expand cold-start, long-tail, and OOD coverage.
- Designed the training and evaluation framework for synthetic traces, demonstrating transferable training signals for downstream sequential recommenders with 8.4%-13.1% Pass@32 improvements while supporting offline simulator-based RL policy learning.

Software Engineer Intern @ Bytedance, San Jose, CA

May. 2024 - Aug. 2024

Machine Learning for Systems, Network Engineering.

- Designed and developed a proactive ingress behavior probing tool for TikTok DNS and CDN users on IP anycast. After the successful deployment on 10+ edges globally, an ingress report for more than 240k DNS resolver IPs can be generated within 10 minutes.

Research Intern @ Alibaba Cloud U.S., Sunnyvale, CA

May. 2023 - Aug. 2023

Code Generation, Large Language Model Evaluation, Cloud Computing, IP Anycast.

- Proposed a coding benchmark with 1011 problems for cloud-native configuration generation and a scalable evaluation platform for LLM assessment, and analyzed the performance of 13 LLMs, offering strategies for quality and efficiency improvement.
- Built an IP anycast optimization system that formulates the AS path prepending optimization as a weighted MAX-SAT problem and proposed an efficient scanning method to obtain the potential connections for global IP anycast clients.

EDUCATION

Ph.D. in Electrical Engineering and Computer Science, **University of California, Merced**

Aug. 2021 - May. 2025

Advisor: Prof. [Wan Du](#). Research Topic: Machine Learning; Generative AI; Networked Systems.

B.Eng. in Computer Software Engineering, **Tsinghua University**

Aug. 2017 - May. 2021

Advisor: Prof. [Mingsheng Long](#). Honor: Outstanding Bachelor's Graduate (10%).

SELECTED PUBLICATIONS

* denotes equal contribution

- Yifei Xu*, Yuning Chen*, Xumiao Zhang*, Xianshang Lin, Pan Hu, Yunfei Ma, Songwu Lu, Wan Du, Z. Morley Mao, Dennis Cai, and Ennan Zhai. **CloudEval-YAML: A Practical Benchmark for Cloud Configuration Generation**. MLSys 2024. [Code](#)
- Yuning Chen, Kang Yang, Zhiyu An, Brady Holder, Luke Paloutzian, Khaled M. Bali, Wan Du. **MARLP: Time-series Forecasting Control for Agricultural Managed Aquifer Recharge**. ACM KDD 2024. [Code](#)
- Kang Yang, Yuning Chen, Wan Du. **Generalizable Radio-Frequency Radiance Fields for Spatial Spectrum Synthesis**. IEEE/CVF CVPR 2026. [Code](#)
- Minyuan Zhou*, Yuning Chen*, Yifei Xu, Jiaqi Zheng, Guihai Chen, Wanchun Dou, Pan Hu, Yongping Tang, Wendong Yin, Jie Lin, Qingyan Yu, Yuanchao Su, Songwu Lu, Wan Du. **AnyPro: Preference-Preserving Anycast Optimization based on Strategic AS-Path Prepending**. USENIX Symposium on Networked Systems Design and Implementation (NSDI) 2026. [Code](#)
- Kang Yang*, Yuanlin Yang*, Yuning Chen*, Sikai Yang, Wan Du. **SoilX: Calibration-Free Comprehensive Soil Sensing Through Contrastive Cross-Component Learning**. ACM/IEEE International Conference on Embedded Artificial Intelligence and Sensing Systems (SenSys) 2026. [Best Paper Award](#). [Code](#)
- Kang Yang, Yuning Chen, and Wan Du. **OrchLoc: In-Orchard Localization via a Single LoRa Gateway and Generative Diffusion Model-based Fingerprinting**. ACM MobiSys 2024 (Extended version published in ACM TMC). [Code](#)
- Yifei Xu*, Yuning Chen*, Xumiao Zhang*, Xianshang Lin, Pan Hu, Yunfei Ma, Songwu Lu, Wan Du, Z. Morley Mao, Ennan Zhai, and Dennis Cai. **CloudEval-YAML: A Realistic and Scalable Benchmark for Cloud Configuration Generation**. Machine Learning for Systems Workshop, NeurIPS 2023. [Code](#)
- (1st author, under submission) **MEMOIR: Disentangling Memory Deficiency from Execution Error in Agentic Reinforcement Learning**.
- (1st author, under submission) **Generative Recommenders are High Fidelity User Simulators**.
- (1st author, under submission) **From Lead-Form Q&A to Commercial Intent: RL Post-Training for Calibrated Intent Scoring**.
- (1st author, under submission) **GenRTC: Enabling Generative Visual Captions in Live Video Streaming**.

TECHNICAL SKILLS

- **Programming:** Python, C++, Go, JavaScript, SQL, MATLAB.
- **ML & AI:** LLM post-training, supervised fine-tuning, reinforcement learning, reward modeling, agentic systems, agentic memory, large embedding models, PyTorch, vLLM, Hugging Face, TensorFlow.
- **Systems & Infrastructure:** Linux, Kubernetes, Git, WebRTC, OpenCV, FFMPEG, MySQL.
- **LLM and RL Systems:** VeRL, VeRL-Agent, Miles, Harbor, SLIME, OpenEnv.

ACADEMIC SERVICES

- **Conference Area Chair:** KDD'25-27 (Applied AI, Coding Agents).
- **Conference Program Committee:** MLSys'26 (Agentic Systems).
- **Conference Reviewer:** NeurIPS'24-25, KDD'25-27, ICML'25, ICLR'25-27, AISTATS'25-26, MM'25-26, IMWUT'26, AAAI'25.
- **Conference Artifact Evaluation Committee:** MobiCom'24-25, MobiSys'24-25.
- **Journal Reviewer:** IEEE TPAMI, IEEE TMC, IEEE TNSE, ACM TOSN, IEEE IoTJ, ACM TIOT.