Huan Wang

Palo Alto, CA joyousprince@gmail.com huan-december.github.io huanwangyale
Google Scholar

Research Interests

Machine Learning, Natural Language Processing, Computer Vision, Large Action Models, AI Agents, Reasoning, and Planning.

Education

Ph.D. **Yale University**, Computer Science — 2008–2013
- Advisor: Prof. Daniel Spielman, Prof. John Wright
- Research on clustering, regression, and dictionary learning

M.Phil. **The Chinese University of Hong Kong**, Information Engineering — 2005–2007
- Advisor: Prof. Xiaoou Tang, Prof. Shuicheng Yan, Prof. Jianzhuang Liu
- Research on face recognition, manifold learning, subspace learning, semi-supervised learning

B.Eng. **Zhejiang University**, Information Engineering, Chu Kochen Honors College — 2000–2004

Professional Experience

Senior Director, Salesforce Research — Palo Alto, CA, Feb 2025 – Present
- Large Action Models (xLAM), AI Agents, Reasoning, Planning, SWE Agents, Agentforce

Director, Salesforce Research — Palo Alto, CA, Nov 2021 – Feb 2025
- Led teams in AI for Operational Research (AIOps), AI for Software, Conversational AI, Time-Series Anomaly Detection, Uncertainty Estimation, and Data Hardness Evaluation

Senior Manager, Salesforce Research — Palo Alto, CA, Nov 2019 – Nov 2021
- Deep learning theory and applications, reinforcement learning, multi-task learning, language modeling, multilingual NER, knowledge graph

Senior Research Scientist, Salesforce Research — Palo Alto, CA, 2018 – Nov 2019
- Deep learning research in large-scale language modeling and vision-language integration

Senior Applied Researcher, Microsoft AI Research — Sunnyvale, CA, 2015 – 2018
- Developed deep learning systems for recommendation, ranking, and intelligent Q&A
- Improved web and local search relevance using neural embeddings

Research Scientist, Yahoo! Labs — New York, NY, 2013 – 2015
- Designed large-scale ML algorithms for search ads prediction and account security prediction
- Leveraged Hadoop, Spark, and Storm for data processing

Adjunct Professor, New York University — New York, NY, 2012 – 2013
- Taught the "Machine Learning" class.

Adjunct Professor, Baruch College — New York, NY, 2012 – 2013
- Taught the "Algorithm Design" class.

Research Intern, Microsoft Research — Redmond, WA, 2011 – 2011
- Projects on anomaly detection and time series modeling

Research Intern, Microsoft Research Asia — Beijing, China, 2010 – 2010
- Projects on anomaly detection, image modeling, and dictionary learning

Honors and Awards

- Best Paper Award, Conference on Learning Theory (COLT), 2012
- Award of Excellence – Stars of Tomorrow, Microsoft Research, Asia
- Bachelor's Degree with Honors, Zhejiang University

Representative Publications

Full publication list: Google Scholar

Large Language Models (LLMs)

- APIGen-MT: Agentic Pipeline for Multi-Turn Data Generation via Simulated Agent-Human Interplay. NeurIPS Datasets & Benchmarks Track, 2025. (*co-corresponding author*),Data, Model
- APIGen: Automated Pipeline for Generating Verifiable and Diverse Function-Calling Datasets. NeurIPS, 2024. [Data], [Model]
- xLAM: A Family of Large Action Models to Empower AI Agent Systems. NAACL, 2024. (*co-corresponding author*), [Code]
- Retroformer: Retrospective Large Language Agents with Policy Gradient Optimization, ICLR, 2024. (*co-corresponding author*)
- CodeGen: An Open Large Language Model for Code with Multi-Turn Program Synthesis, ICLR, 2023. [Code]

AI Agents and Multi-Agent Systems

- AgentLite: A Lightweight Library for Building and Advancing Task-Oriented LLM Agent System. Arxiv, 2024. [Code]
- CRMArena: Understanding the Capacity of LLM Agents to Perform Professional CRM Tasks in Realistic Environments. NAACL, 2025. [Code]
- MCPEval: Automatic MCP-based Deep Evaluation for AI Agent Models. Arxiv, 2025. [Code]
- REX: Rapid Exploration and eXploitation for AI Agents. Arxiv, 2023.

LLM Reasoning

- Language Models are Hidden Reasoners: Unlocking Latent Reasoning Capabilities via Self-Rewarding. Arxiv, 2024.
- PRACT: Optimizing Principled Reasoning and Acting of LLM Agent. SIG CoNLL, 2024.
- LATTE: Learning to Think with Vision Specialists. Arxiv, 2024.

Reinforcement Learning

- Policy Finetuning: Bridging Sample-Efficient Offline and Online Reinforcement Learning. NeurIPS, 2021.
- WarpDrive: Extremely Fast End-to-End Deep Multi-Agent Reinforcement Learning on a GPU. arXiv, 2021.
- On the Generalization Gap in Reparameterizable Reinforcement Learning. ICML, 2019.

Uncertainty Estimation & Reliability

- Improved Online Conformal Prediction via Strongly Adaptive Online Learning. ICML, 2023.

- Understanding the Under-Coverage Bias in Uncertainty Estimation. NeurIPS, 2021.
- Don't Just Blame Over-parametrization for Over-confidence: Theoretical Analysis of Calibration in Binary Classification. ICML, 2021.

Time Series, Causality and Neural Editing

- Merlion: End-to-End Machine Learning for Time Series. JMLR, 2023
- Causal Layering via Conditional Entropy. PMLR, 2024.
- Salesforce CausalAI Library: A Fast and Scalable Framework for Causal Analysis of Time Series and Tabular Data. Arxiv, 2023.
- On the Unlikelihood of D-Separation. Arxiv, 2023.
- Editing Arbitrary Propositions in LLMs without Subject Label. Arxiv, 2024.

Earlier Work in Machine Learning and Sparse Representation

- Exact Recovery of Sparsely-Used Dictionaries. COLT, 2012. ***Best Paper Award.***
- Trace ratio vs. ratio trace for dimensionality reduction. CVPR, 2007.
- Adaptive Dropout with Rademacher Complexity Regularization. ICLR, 2018.
- Trace ratio vs. ratio trace for dimensionality reduction. CVPR, 2007.

Open Source Projects

Large Action Models and AI Agents

- xLAM: A family of large action models for AI agent systems.
- AgentLite: A lightweight library for building task-oriented LLM agent systems.
- BOLAA: Towards Better Optimization of Language Model Alignment.
- CRMArena: A benchmark for evaluating LLM agents on professional CRM tasks.
- MCPEval: Automatic MCP-based deep evaluation for AI agent models.
- PersonaBench: A benchmark for persona-based conversation systems.
- MobileAIBench: A benchmark for evaluating AI systems on mobile devices.

Function Calling and API Generation

- APIGen: Automated pipeline for generating verifiable and diverse function-calling datasets.
- APIGen-MT: Agentic pipeline for multi-turn data generation via simulated agent-human interplay.

Code Generation and Software Engineering

- CodeGen: A family of open-source models for code generation.
- CoDA: Coding language models via diffusion adaptation.
- LoCoBench: A benchmark for long-context large language models in complex software engineering.
- Diversity Empowers Intelligence: Integrating expertise of software engineering agents.

Vision and Multimodal Models

- LATTE: Learning to think with vision specialists.
- xGen-MM (BLIP3): Multimodal generative models. [Code]
- UniControl: A unified diffusion model for controllable image generation.
- Hive: Harnessing Human Feedback for Instructional Visual Editing.

Reinforcement Learning and Optimization

- WarpDrive: Extremely fast end-to-end deep multi-agent reinforcement learning on GPU.
- UserRL: User-Centric Reinforcement Learning.
- UserBench: An Interactive Gym Environment for User-Centric Agents.

Prompt Optimization

- Promptomatix: A powerful framework for LLM prompt optimization.

- Retroformer: Retrospective large language agents with policy gradient optimization.

Time Series and Causal Learning

- Merlion: An easy-to-use library for time series anomaly detection and forecasting. [Blog]
- CausalAI: A library for causal inference and causal discovery.

Dialog and Conversation Systems

- Converse: A framework for conversational AI applications.
- DialogStudio: A comprehensive dialogue understanding benchmark and toolkit.

Skills

Technical: Machine Learning, Deep Learning, Reinforcement Learning, NLP, Computer Vision, Algorithms, AI Agents, Data Mining

Programming: Python, PyTorch, TensorFlow, Spark, Hadoop

Languages: English, Chinese