Jingkun An

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Education

Beihang University, Beijing — September 2024 – Present

Master, Major in Artificial Intelligence.

Beihang University, Beijing — August 2020 – June 2024

Bachelor of Engineering, Major in Software Engineering, GPA 3.78/4.00.

Technical Skills

- **Programming Languages**: Python, Java, C
- **Artificial Intelligence**: Familiar with machine learning and deep learning fundamentals, Diffusers, Transformers, LLM application and fine-tuning, proficient in Scikit-Learn, PyTorch, etc.
- **Application Development**: Experienced with Django; familiar with Docker, MySQL, etc.

First Author Paper

3D Spatial Reasoning Model with Advanced Dataset and Benchmark — Feb 2025 – May 2025

- **Publication:** "RoboRefer: Towards Spatial Referring with Reasoning in Vision-Language Models for Robotics", **accepted** in *Conference on Neural Information Processing Systems (NeurIPS)*, 2025.
- **Description:** We developed a novel 3D-aware Vision-Language Model for multi-step spatial referring with explicit reasoning. To train and evaluate the RoboRefer model, we introduced RefSpatial, a large-scale dataset containing over 2.5 million high-quality data entries and defines 31 fine-grained spatial relations, and RefSpatial-Bench, a complex spatial referring benchmark with multi-step reasoning. Achieving a new SOTA, the RoboRefer model got an average accuracy of 89.6% on spatial relation understanding benchmarks and surpassed Gemini 2.5 Pro by 17.4% on complex spatial referring tasks. The open-sourced assets have been downloaded over 8,000 times. [Project page].
- **Supervisor:** Cheng Chi (Researcher of BAAI), Shanghang Zhang (Professor of Peking University)

AI-Driven Text-to-Image Model Alignment Method — Dec 2023 – Aug 2024

- **Publication:** "AGFSync: Leveraging AI-Generated Feedback for Preference Optimization in Text-to-Image Generation", **accepted** in *Proceedings of the AAAI Conference on Artificial Intelligence*, 2025.
- **Description:** This research introduced a fully AI-driven method to enhance T2I models like SDXL. The approach first employs a self-training methodology to autonomously generate preference data, which is then used to fine-tune the model via Direct Preference Optimization (DPO). This low-cost process, requiring no human intervention, improved SDXL's text consistency and aesthetic properties by 7% and generated higher-quality images than prior methods in over 65% of samples. Ultimately, the method surpassed the previous SFT dataset approach (MJHQ-30K) by 5%. [Project page].
- **Supervisor:** Yemin Shi (PhD, Peking University; Co-founder & CTO of Dynamics Lab)

Bias Mining and Mitigation Algorithm — Dec 2022 – Jun 2023

- **Publication:** "M3Fair: Mitigating Bias in Healthcare Data through Multi-Level and Multi-Sensitive-Attribute Reweighting Method", abstract **accepted** in *Health Data Science, 2023, Beijing*.
- **Description:** Developed a custom algorithm to address biases across multiple features in medical electronic health records. The core of the method involves classifying multiple sensitive-attribute features into different bias levels and then performing a multi-level reweighting operation. This approach is both generalizable and scalable, allowing for the flexible customization of fairness levels within clinical decision-making processes. In practice, this approach proved highly effective, successfully mitigating bias in 91.67% of samples and surpassing the performance of previous mitigation methods on 83.3% of samples. This algorithm won the **third prize** (Top 5) in 2023 NIH Bias Detection Tools in Health Care Challenge. [Project page].
- **Supervisor:** Lu An (PhD, NC State University; AI Engineering Manager of NVIDIA)

Other Paper

Attack Methods for Medical Multimodal Large Language Models Apr 2024 – Aug 2024

- **Publication:** "Medical MLLM is Vulnerable: Cross-Modality Jailbreak and Mismatched Attacks on Medical Multimodal Large Language Models", **accepted** in *Proceedings of the AAAI Conference on Artificial Intelligence*, 2025.
- **Description:** This work proposed two novel attack methods: 2M-attack and O2M-attack. These attacks disrupt MedMLLMs by introducing mismatched malicious inputs, with the O2M-attack proving more effective. MedMLLMs remain vulnerable to these attacks, even with enhanced security features.
- **Supervisors:** Chengwei Pan (PhD, Peking University; Professor of Beihang University)

Internship & Research Experience

School of Computer Science, Peking University Feb 2025 – Present

- **Description:** During this internship, I drove key aspects of the RoboRefer project by independently building the RefSpatial dataset, a large-scale collection of 2.5 million entries designed to boost a model's reasoning. I also introduced RefSpatial-Bench which is a challenging spatial referring benchmark with multi-step reasoning. My work, which was foundational to the project, was validated when our model achieved significant performance improvements. Furthermore, I assisted in training the RoboBrain 2.0 model, which, thanks to this foundational dataset, surpassed Gemini 2.5 Pro by 20% in spatial understanding.

School of Electronic and Computer Engineering, Peking University Dec 2023 – Aug 2024

- **Description:** Contributed to the enhancement of an interior design image generation model, gaining hands-on experience in training diffusion models and applying alignment methods such as DPO and SFT. Through a collaboration between the university lab and Dynamics Lab Technology Company, I developed and refined the model for commercial application, which ultimately became the enterprise-level product DragonDiffusion, which surpassed the performance of the base model by 30%.

Project Experience

TrustMe: A trusted AI platform to assist clinical decision-making Dec 2022 – Sep 2023

- **Description:** Built a trusted AI platform to assist clinical decision-making based on electronic medical records. The platform integrates data analysis with our custom fairness detection and mitigation algorithms, surpassing previous AI diagnostic models by 10%. Demonstrating its real-world value, the system has been adopted by multiple top-tier Grade 3A hospitals in China. [News]
- **Role:** Project Leader: Coordinated team members' work and developed the core bias detection algorithms.
- **Achievements:** This project won multiple national awards including the Grand Prize **(First Place)** at the 2023 "Challenge Cup" National Competition.

Awards

- 2023 National College Student "Challenge Cup" (National Grand Prize, Top 1)
- 2023 NIH Bias Detection Competition (International Third Prize, Top 5)
- 2023 "Internet+" Innovation and Entrepreneurship Competition (Second Prize, Top 10%)
- 2023 & 2024 Beijing College Student Entrepreneurship Project (Excellence Award, Top 5%)
- 2023 Fengru Cup Main and Industrial Track at Beihang University (Second Prize, Top 3%)
- 2024 May Fourth Medal Nomination Award (Top 0.1%)
- 2024 Outstanding Graduate of Beijing (Top 1%)
- 2023 Aviation Industry Scholarship (Top 1%)
- 2023 Star of the School of Software (Top 3%)
- 2023 Merit Student of Beihang University (Top 5%)

Additional Information

- **Languages**: TOEFL Score 103