Jingkun An

✉ anjingkun02@gmail.com · ☎ (+1) 919-713-8066 · ⚲ Google Scholar · ⚙ Homepage

🎓 Education

Beihang University, Beijing   Aug. 2020 – Jun. 2024

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

🏷 Technical Skills

- **Programming Languages**: Python, Java, C
- **Artificial Intelligence**: Proficient in PyTorch and Scikit-Learn; familiar with Machine Learning and Deep Learning fundamentals, Diffusers, Transformers, Diffusion Model fine-tuning, and LLM Deployment.
- **Software Development**: Experienced with Django; familiar with Docker, MySQL, etc.

📑 First Author Paper

3D Spatial Reasoning Model with Advanced Dataset and Benchmark   Dec. 2024 – May 2025

- **Publication:** "RoboRefer: Towards Spatial Referring with Reasoning in Vision-Language Models for Robotics", *NeurIPS 2025* (**Accepted**). [Project page].
- **Overview:** Developed *RoboRefer*, a novel 3D-aware Vision-Language Model for multi-step spatial referring with explicit reasoning.
- **Dataset:** Defined 31 fine-grained spatial relations to construct *RefSpatial*, the largest spatial understanding and referring dataset with over **20 million** QA pairs and human-like reasoning processes.
- **Benchmark:** Built *RefSpatial-Bench*, the first spatial referring benchmark with multi-step reasoning.
- **Performance:** Established a new SOTA where *RoboRefer* achieves **89.6%** accuracy on spatial understanding benchmarks, and surpasses *Gemini 2.5 Pro* by **17.4%** on complex spatial referring tasks.
- **Impact:** Garnered over **15,000 downloads** for the open-sourced assets. Facilitated evaluation of spatial referring in complex scenes for the most advanced models like *Qwen3-VL* and *Gemini-Robotics-1.5*.
- **Supervisor:** Lu Sheng (Prof. of Beihang University), Shanghang Zhang (Prof. of Peking University)

Enhancing Text-to-Image Generation via Fully AI-Driven Feedback   Dec. 2023 – Aug. 2024

- **Publication:** "AGFSync: Leveraging AI-Generated Feedback for Preference Optimization in Text-to-Image Generation", *AAAI 2025* (**Published**). [Project page].
- **Overview:** Developed a fully AI-driven framework to enhance Text-to-Image models (e.g., SDXL, SD v1.5) via Direct Preference Optimization (DPO), eliminating the need for costly human annotation.
- **Methodology:** Utilized a self-training strategy that leverages constraints derived from instructions and the physical world to autonomously generate preference data. Fine-tuned Text-to-Image models via DPO.
- **Performance:** Achieved a **7%** improvement in text consistency and aesthetic quality for SDXL. Enabled Text-to-Image models to generate higher-quality images in **67%** of samples compared to baselines. Surpassed previous SFT approaches (using MJHQ-30K) by **5%**.
- **Supervisor:** Yemin Shi (PhD, Peking University; Co-founder & CTO of Dynamics Lab)

3D Trajectory Planning Model with Advanced Dataset and Benchmark   Aug. 2025 – Nov. 2025

- **Publication:** "RoboTracer: Mastering Spatial Trace with Reasoning in Vision-Language Models for Robotics", *CVPR 2026* (**Under review**).
- **Overview:** Proposed *RoboTracer*, the first 3D-aware VLM that achieves both 3D spatial referring and measuring as key perceptual cues for accurate spatial trace generation.
- **Dataset:** Constructed *TraceSpatial*, a large-scale dataset of **30 million** QA pairs, covering outdoor/indoor/tabletop scenarios, to enable the model to learn 3D spatial referring and measuring in the SFT stage, and further achieve spatial trajectory planning in the RFT stage.
- **Benchmark:** Built *TraceSpatial-Bench* which contains 100 real-world images with manually annotated tasks involving 3D object localization/movement/placement and is the first benchmark for 3D trajectory planning.

- **Performance:** Achieved SOTA results where *RoboTracer* gains **76.3%** success rate on spatial measuring (**+14%** vs *Gemini 2.5 Pro*) and outperforms *Gemini 2.5 Pro* by **36%** on 3D trajectory planning tasks.
- **Supervisor:** Lu Sheng (Prof. of Beihang University), Shanghang Zhang (Prof. of Peking University)

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", *Health Data Science, 2023, Beijing* (Abstract **Accepted** for Poster) [Project page].
- **Overview:** Developed a generalizable and scalable algorithm to detect and mitigate biases across multiple features in Electronic Health Records (EHR).
- **Methodology:** Introduced a multi-level reweighting strategy that classifies multiple sensitive attributes into different bias levels. Proposed a multi-level reweighting algorithm to mitigate bias within different samples, ensuring minimum bias during the training process.
- **Performance:** Demonstrated superior effectiveness, successfully mitigating bias in **91.67%** of samples and outperforming previous mitigation methods on **83.3%** of cases.
- **Recognition:** Won the **Third Prize** (Top 5) in the global *2023 NIH Bias Detection Challenge*.
- **Supervisor:** Lu An (PhD, NC State University; AI Engineering Manager of NVIDIA)

👥 INTERNSHIP & RESEARCH EXPERIENCE

School of Computer Science, Peking University   Dec. 2024 – Present

- **Description:** Took charge of the 3D spatial dataset construction for the *RoboRefer* and *RoboTracer* projects. Utilized the *RefSpatial dataset* to assist in training the RoboBrain 2.0 model for the research group, which surpasses Gemini 2.5 Pro by 20% in spatial understanding.

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

- **Description:** Gained experience in training diffusion models and applying alignment methods such as DPO and SFT. Applied the *AGFSync* framework to improve the performance of an image generation model for commercial application, which was a collaborative project between the university lab and Shenzhen RabbitPre AI Technology Company.

⚙️ PROJECT EXPERIENCE

TrustMe: A Trustworthy AI Platform for Clinical Decision-Making   Dec. 2022 – Sep. 2023

- **Description:** Built a trustworthy AI platform to assist clinical decision-making based on electronic medical records. The platform integrates data analysis with bias 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. [News]

♡ 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 Outstanding Graduate of Beijing   (Top 5%)
- 2024 May Fourth Medal Nomination Award   (Top 0.1%)
- 2023 Aviation Industry Scholarship   (Top 1%)
- 2023 Star of the School of Software   (Top 3%)
- 2023 Merit Student of Beihang University   (Top 5%)

ℹ ADDITIONAL INFORMATION

- **Languages**: TOEFL Score 103