Mengdi JIA

mengdi__jia@163.com https://mengdijia.github.io/

EDUCATION

Anhui Agricultural University

Master of Engineering in Agricultural Engineering *2020.09 - 2023.06*

- **GPA:** 3.54 / 4.0 (Top 10%)

Hebei Agricultural University

Bachelor of Engineering in Mechanical Design, Manufacturing & Automation *2014.09 - 2018.06*

- **GPA:** 3.52 / 4.0 (Top 3%)
- **Honors:** **First-Class** scholarship (2014-2018, annually)
  Outstanding Graduation Project
  Champion, China National Finals, World Robot Olympiad

RESEARCH EXPERIENCES

OmniSpatial: Towards Comprehensive Spatial Reasoning Benchmark for Vision-Language Models

Mengdi Jia[1*], *Zekun Qi*[14*], *Shaochen Zhang*[2], *Wenyao Zhang*[34], *Xinqiang Yu*[4], *Jiawei He*[4], *He Wang*[45], *Li Yi*[16†] *NeurIPS, 2025*

- https://arxiv.org/abs/2506.03135
- **Benchmark:** Proposed **OmniSpatial**, a novel and comprehensive spatial reasoning benchmark addressing limitations of existing vision-language evaluations predominantly focused on high level spatial tasks.
- **Categorization Framework:** Established a structured categorization comprising four dimensions—dynamic reasoning, complex spatial logic, spatial interaction, and perspective-taking—to enhance evaluation complexity and breadth.
- **Dataset Construction:** Constructed the OmniSpatial dataset by crawling and curating diverse visual data from global sources, spanning various scenes, resolutions, illumination conditions, and weather scenarios, ensuring realistic and comprehensive evaluation contexts.
- **Model Evaluation and Insights:** Performed thorough evaluations of state-of-the-art vision-language models (e.g., ChatGPT O3, Gemini-2.5-Pro), identifying notable deficiencies in advanced spatial reasoning and providing actionable insights for future research.
- **Reasoning Enhancement:** Enhanced spatial reasoning capabilities of VLMs through integrating auxiliary models using a chain-of-thought approach, demonstrating effective strategies for complex multimodal reasoning.

Experimental Investigation on the Crack Propagation Principle of Pecan under Heating State

Mengdi Jia[1] *Master's Thesis, 2023*

- Developed a real-time weight and temperature monitoring system using LabVIEW, implemented a crack detection algorithm with YOLOv8, and constructed a moisture prediction model using near-infrared spectroscopy and BP neural network.

Biophotonics Lab, Dept. of Electronics, Tsinghua University

Intern *2019/12 - 2020/09*

- Developed biomedical device components using OpenCV, C++, Qt and SolidWorks for photoacoustic imaging systems.

SKILLS

Language: IELTS 5.5

Programming Languages: Python, C++, C, MATLAB, LaTeX

Frameworks & Tools: PyTorch, NumPy, Pandas, OpenCV, Linux, Jetson, STM32

WORK EXPERIENCES

Beijing Donghong Zhiyuan Medical Technology Co., LTD

Mechatronics Engineer (Project Leader) *2024/05 - Present*

- Leading electromechanical design and lifecycle management of surgical instruments and endoscopes.

Beijing Precision Medical Technology Co., LTD

Project Engineer *2023/07 - 2024/04*

- Developed robotic end-effectors and calibration methods for MR-guided surgical systems.

Solidreamer Co., LTD

Co-founder *2014/12-2017/06*

- Provided robotics and STEM training for teenagers, organized workshops, designed educational programs.

PUBLICATIONS AND PATENTS

Experimental Research on Cotton Seed Depth Detection System Based on Magnetic Field

Jia Kang, Nan Wang, Haiyong Jiang, Pengyun Xu, ***Mengdi Jia****, Limin Shao* *Graduation Project, Mar. 2021*

- Published in *Journal of Agricultural University of Hebei*, Vol. 44 No. 2.
- DOI:10.13320/j.cnki.jauh.2021.0033.
- Independently conducted as my undergraduate graduation project, later published collaboratively.

A device and method for light emission protection of photoacoustic probes based on transparent capacitive films

Wu Zhen, Wang Xiaojun, Song Hongfei, ***Jia Mengdi****, Fang Chenyu* *Nov. 2023*

- Patent No.: CN 113827183 B

Monitoring devices and methods for visible and invisible light energy of lasers

Song Hongfei, Wang Xiaojun, Wu Zhen, Fang Chenyu, ***Jia Mengdi****, Wei Shengyi* *Jan. 2022*

- Patent No.: CN 113970371 A

A differential analog transmission system for the acquisition of photoacoustic signals

Song Hongfei, Wang Xiaojun, Wu Zhen, Fang Chenyu, ***Jia Mengdi****, Wei Shengyi* *Jan. 2022*

- Patent No.: CN 113966996 A

A laser emission protection method applicable to photoacoustic imaging systems

Wu Zhen, Wang Xiaojun, Song Hongfei, ***Jia Mengdi****, Fang Chenyu* *Dec. 2021*

- Patent No.: CN 113827184 A

A differential analog transmission device for photoacoustic signal acquisition

Song Hongfei, Wang Xiaojun, Wu Zhen, Fang Chenyu, ***Jia Mengdi****, Wei Shengyi* *Jan. 2021*

- Patent No.: CN 212326383 U

Monitoring devices for visible and invisible light energy of lasers

Song Hongfei, Wang Xiaojun, Wu Zhen, Fang Chenyu, ***Jia Mengdi****, Wei Shengyi* *Jan. 2021*

- Patent No.: CN 212340426 U

A seed depth detection system based on magnetic field

Jia Mengdi*, Feng Yongfei, Jiang Haiyong, Zhou Yongjie, Wang Nan* *Apr. 2019*

- Patent No.: CN 208736340 U

An Extrusion Device for Additive Manufacturing of Flexible Materials Using Hard Materials

Jia Mengdi *Apr. 2018*

- Patent No.: CN 207273878 U

A Peach Flower Stamen Cutting Mechanism

Du Yujie, ***Jia Mengdi*** *Mar. 2018*

- Patent No.: CN 207054379 U