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:** 3.62 / 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 5%)
- **Honors: First-Class** scholarship(2014-2016), **Champion** of the World Robot Olympiad, **Outstanding** Graduation Project

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://qizekun.github.io/omnispatial/
- **Benchmark:** Proposed **OmniSpatial**, a novel and comprehensive spatial reasoning benchmark addressing limitations of existing vision-language evaluations predominantly focused on basic spatial tasks (e.g., relative positioning, proximity, and counting).
- **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 (images and videos) 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 utilizing near-infrared spectroscopy combined with a BP neural network.

SKILLS

Languages: IELTS 5.5, Japanese
Programming Languages: Python, C++, C, MATLAB, LaTeX
Libraries: PyTorch, Numpy, Pandas, OpenCV
Misc: Linux, Embedded systems (Jetson, STM32), SolidWorks

WORK EXPERIENCES

Beijing Donghong Zhiyuan Medical Technology Co., LTD

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

- Lead electromechanical system designs for medical devices including high-frequency surgical instruments and endoscope systems, managing the complete product lifecycle from R&D to large-scale production.

Beijing Precision Medical Technology Co., LTD

Project Engineer *2023/07 - 2024/04*

- Designed end-effectors for real-time MR image-guided robotic puncture surgery, developed sensor calibration devices, and performed robotic calibration and precision enhancement.

Biophotonics Lab, Dept. of Electronics, Tsinghua University

Intern *2019/12 - 2020/09*

- Developed biomedical device components using SolidWorks for photoacoustic imaging systems.

PUBLICATIONS AND PATENTS

Experimental research on cotton seed depth detection system based on magnetic field
*KANG Jia, WANG Nan, JIANG Haiyong, XU Pengyun, **JIA Mengdi**, SHAO Limin* *Published, Mar. 2021*
- Vol.44 No.2 http://hauxb.hebau.edu.cn, DOI:10.13320/j.cnki.jauh.2021.0033

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