


Name: Tianle Zeng	Nationality: China	
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Tel: (+86)19927538993	Education: Master of Science	
Research interests: SLAM, 3D Reconstruction, Embodied intelligence for robots.		

Education Background

Bachelor	GPA/Rank: 87/20%	2018-2022
South China Agricultural University	Electronic Information Science and Technology	
Master	GPA/Rank:96/1%	2022-2025
China University of Mining and Technology(Beijing)	Geoscience and Surveying Engineering	
University of Leeds(Dual Master Degree with CSC scholarship)	Mechatronics and Robotics	

Research Achievements

Conference (First author):
0. Realistic Surgical Images Dataset Generation Based on 3D Gaussian Splatting. International Conference on Medical Image Computing and Computer Assisted Intervention(MICCAI). 2024.
Journal (First author):
0.Novel Instrument Deformation Synthesis Based on Dynamic 3D Gaussian Reconstruction. IEEE Transactions on Medical Imaging.(Under Review) 2024.
1.Gait-based Guiding System: A New Approach for Blind Guidance. Science China-Information Sciences.(Under Review). 2024.
2.A Novel Automatic Extrinsic Calibration Method for LiDAR-Camera System. IEEE Transactions on Instrumentation and Measurement. 2024.
3.Laser SLAM method based on spatial geometric features in degraded environment. Journal of Chinese Inertial Technology. 2023.

Honors

China Post-graduate Mathematical Contest in Modeling(2022)	National Third Prize
HUAWEI Intelligent Mining Contest(2022)	Innovation Award
The China Graduate Electronics Design Contest(2023)	National Second Prize
Outstanding Graduate Scholarship(2023)	First-class Scholarship
China Scholarship Council(CSC) Scholarship(2023-2024)	First-class Scholarship

Internships

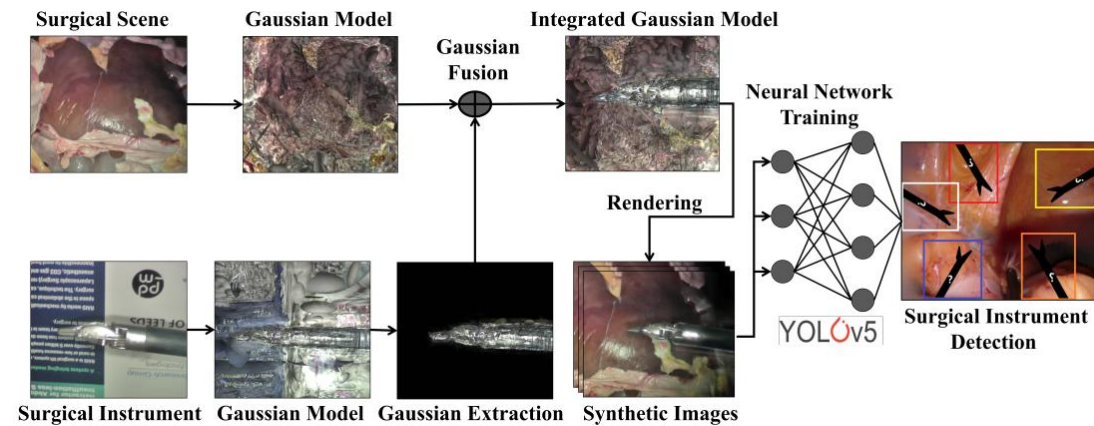
DJI	SLAM Algorithm Engineer Inter (2023)
● Developing multi-sensor fusion SLAM algorithm for UAVs.	
Autel Robotics	AI Application Developing Engineer Intern (2023)
● Developing SLAM algorithm in Drones.	
● Developing multi-sensor calibration method.	
China Shipbuilding Industry Corporation (CSIC)	Computer Vision Engineer Intern (2022)
● Developing deep learning based digital meter reorganization method	

Research Experience

Realistic Surgical Image Dataset Generation Based On 3D Gaussian Splatting (2024)

Main participant

Institute: STORM LAB UK, University of Leeds



This research introduced a novel method inspired by 3D Gaussian Splatting, specifically focus on the generation of medical image datasets that feature various surgical instruments across different surgical scenes.

1. First research to utilize 3D Gaussian Splatting for medical dataset generation, providing a novel methodological approach for generating surgical image datasets.
2. A new technique was developed for the precise editing of 3D Gaussian models. This allows for independent manipulation and flexible combination of surgical scenes and instruments, significantly enhancing the diversity of the synthetic image datasets.
3. The proposed method is capable of automatically generating accurate annotation for the synthetic images, facilitating easier and more efficient data handling.
4. Extensive experiments were conducted to demonstrate the high quality of the synthetic images. The results illustrated that the synthetic images can use to pre-train neural networks gaining a strong realistic prior before real data is used.

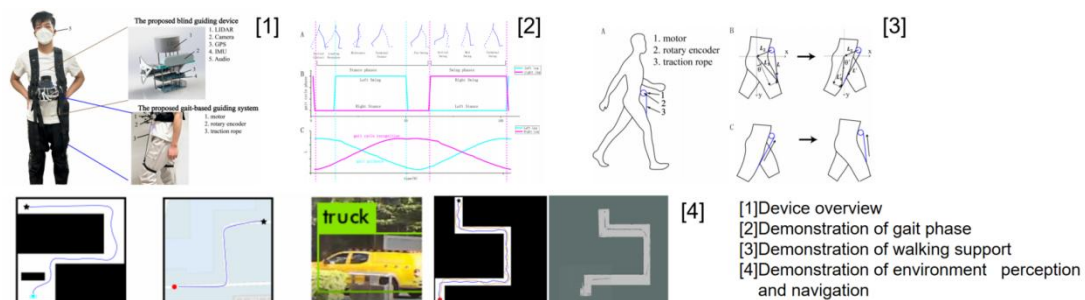
- A research paper **accepted** by International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI).

Now I am working for a research paper about 3DGS based deformable scene reconstruction method to IEEE Transactions on Medical Imaging.

Gait-based Guiding System: A New Approach for Blind Guidance (2023)

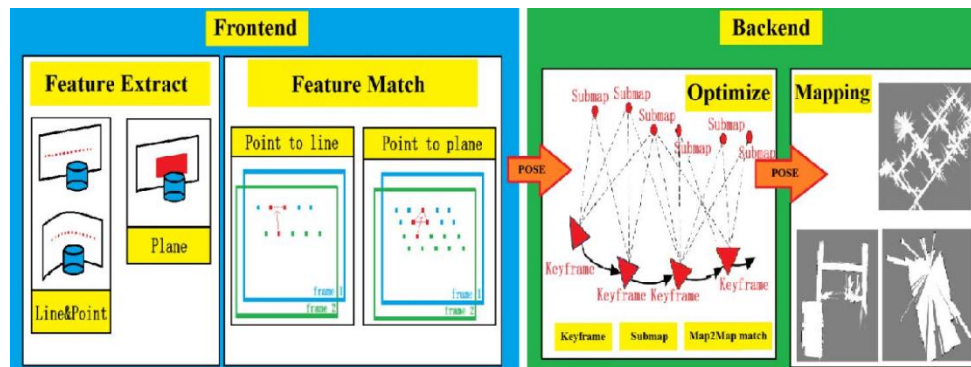
Research Leader

Institute: China University of Mining and Technology, Beijing



Introduced a novel wearable device designed to assist patients with impaired vision. The device integrates gait phase analysis for walking support and navigation and employs multi-modal sensing for environmental perception.

1. Developing an advanced fusion laser SLAM method achieving real-time operation in degraded environments. Enhanced spatial feature extraction and point cloud registration lead to backend optimizations in global mapping and submap interpolation. Achieved a performance four times faster than Hector-SLAM with frontend odometry errors less than 0.5m within 20m.



2. Design and build hardware and software systems for devices, including an innovative wearable alert system that utilizes sensor fusion data to provide users with clear and precise obstacle avoidance warnings. Introduced a path planning and obstacle avoidance algorithm capable of real-time operation in highly dynamic environments.

- Won the National Second Prize (<3%) in THE CHINA GRADUATE ELECTRONICS DESIGN CONTEST (2023). **Published** a paper titled *Laser SLAM Method Based on Spatial Geometric Features in Degraded Environments* in the *Journal of Chinese Inertial Technology*. Submitted a research paper to *Science China-Information Sciences* (under review).

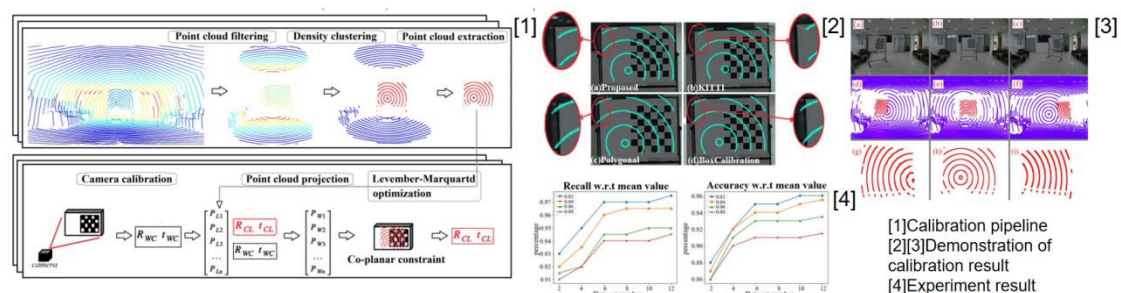
Research on Multi-Sensor Fusion SLAM for Unmanned Aerial Vehicle (UAV) Platforms (2023)

Main participant

Institute: DJI

This research focused on achieving precise self-localization in complex, highly dynamic environments for multi-sensor-equipped UAVs and exploring methods for calibrating multiple sensors, including designing the sensor installation layout to achieve the best sensing performance.

1. Optimizing the UAV platform's multi-sensor fusion SLAM system by designing a new feature point extraction method, enhancing the feature point matching mechanism, and adjusting backend optimization methods. Utilizing IMU for motion compensation, significantly improved the overall speed and accuracy of the fused SLAM system's pose estimation.



2. Developing a multi-sensor calibration method, which automatically detects calibration planes and establishes spatial geometric constraints. This method achieves high-precision sensor calibration with minimal data and requires no manual intervention throughout the process.

- A research paper to *IEEE Transactions on Instrumentation and Measurement*.