



Hu Yang

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16 years in 3D reconstruction engineering SfM / MVS / Point Clouds / Mesh / Texture Mapping

Large-scale production reconstruction systems

Profile

Full-stack 3D reconstruction algorithm engineer with 15 years of experience in R&D and production delivery. Deep expertise across SfM, MVS, point-cloud processing, mesh reconstruction, and texture mapping. Led large-scale 3D reconstruction for 55M+ real spaces at Beike Realsee, with algorithm-system stability reaching 99.99%. Strong ability to build technical architecture from zero to one, lead core projects, optimize CUDA and distributed cloud reconstruction systems, and deliver commercial value across indoor large-scene reconstruction, hardware calibration, LiDAR SLAM, oblique photogrammetry, and LiDAR point-cloud processing. Six consecutive years of top-tier performance ratings in a core business line.

Work Experience

Beike Realsee	3D Reconstruction Algorithm Architect	2019.01-Present
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Responsibilities:

1. Owned the overall technical architecture and core module development for Beike VR house-tour 3D reconstruction.
2. Led technical design and delivery for large-scene reconstruction, LOD rendering, hardware calibration, and cloud LiDAR SLAM frameworks.
3. Led algorithm-team work on end-to-end efficiency optimization, performance acceleration, and production stability.
4. Implemented core algorithm code, handled critical technical problems, and evaluated new-business technical directions.
5. Worked with engineering and product teams to align technical roadmap with business goals.
6. Managed code quality, engineering standards, and reusable technical assets across the team.

Achievements:

1. Built the foundational 3D reconstruction capability for Beike VR house tours, including overall design and core code.
2. Built an indoor large-scene reconstruction system from zero to one, contributing over 70% of core code and commercializing LOD viewing capability.
3. Designed the full hardware-calibration framework and implemented core calibration code, improving calibration accuracy for next-generation VR scanning devices.
4. Optimized the full algorithm chain with CUDA and other techniques, reducing 24K image ISP time from 900s to 6.5s and one VR reconstruction from 20min to 8.5min.
5. Completed the cloud LiDAR SLAM framework design and core implementation, expanding the company's multi-sensor reconstruction system.
6. Received performance rating 4 or above for six consecutive years.

Feima Robotics, Beijing	3D Reconstruction Algorithm Engineer	2017.10-2019.01
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Responsibilities:

1. Developed UAV aerial-image 3D reconstruction algorithms, focusing on multi-view dense matching and DSM generation.
2. Developed very-large-scale image loading, browsing, and LOD display engines.
3. Designed and implemented rendering algorithms for mosaic-editing software.

Achievements:

1. Independently developed an efficient tSGM multi-view dense matching algorithm, the company's first core 3D reconstruction algorithm.
2. Designed and implemented a large-scale image loading and browsing engine, then delivered mosaic editing and rendering workflows on top of it.
3. Solved aerial triangulation reconstruction under GNSS-only control without ground control points, improving practical UAV surveying accuracy.

Infinite3D / Jingzhi 3D, Beijing**Co-founder, Technical Executive Director**

2014.10-2017.10

Responsibilities:

1. Led R&D and iteration of full-process oblique photogrammetry 3D reconstruction software.
2. Managed code standards, code quality, engineering optimization, and performance tuning.
3. Led development and debugging of large-scale image SfM algorithms for aerial-scene reconstruction.
4. Led high-precision small-object 3D reconstruction algorithm development and adaptation.
5. Designed and implemented dedicated reconstruction software for array-camera hardware.

Achievements:

1. Core contributor to Infinite3D-Real Scenes, one of China's first domestic oblique photogrammetry reconstruction software systems.
2. Led overall technical architecture and core module implementation, establishing a complete and practical reconstruction pipeline.
3. Completed full-process reconstruction software for array-camera data, expanding hardware support.
4. Improved software efficiency and large-scale imagery processing through algorithm engineering and code-quality control.

Glodon**Senior C++ R&D Engineer**

2014.04-2014.10

Responsibilities:

1. Developed, maintained, and iterated foundational C++ SDKs supporting engineering software modules.
2. Designed and optimized base display components for construction-management software.
3. Owned dedicated SDK development tasks, including implementation, debugging, quality control, and delivery.

Achievements:

1. Delivered a construction-report display SDK with stable rendering performance and accuracy.
2. Independently developed a PDF signature SDK supporting signing, verification, and permission control.
3. Strengthened low-level C++ SDK capability and improved integration with upper-layer engineering software.

China Coal Aerial Surveying and Remote Sensing Bureau**3D Reconstruction Algorithm Engineer**

2011.07-2014.04

Responsibilities:

1. Developed core LiDAR point-cloud algorithms, mainly ground/non-ground classification.
2. Designed and implemented LiDAR point-cloud vectorization modeling algorithms and supporting software.
3. Designed and solved core real-time stereo-pair rendering problems for aerial imagery.

Achievements:

1. Developed a progressive TIN densification LiDAR filtering algorithm comparable to Terrasolid TerraScan in efficiency and quality.
2. Led algorithm design for LiDAR point-cloud vectorization modeling software, a core part of an award-winning aerial-image and LiDAR reconstruction system.
3. Solved a real-time aerial stereo rendering bottleneck in three days after it had blocked the image lab for two months, matching Inpho-level visual quality.

Heilongjiang Bureau of Surveying, Mapping and Geoinformation**Web GIS Developer**

2010.07-2011.07

Responsibilities:

1. Developed frontend and backend components for online electronic maps.

Achievements:

1. Completed map development for the Heilongjiang geographic information sharing service platform.

Project Experience

Beike Realsee VR House-Tour 3D Reconstruction

Technical Lead

2019.01-Present

Description:

Core technical foundation for Beike VR house tours, providing high-precision, high-efficiency, high-stability indoor real-estate reconstruction for massive online viewing and 55M+ modeled real spaces.

Achievements:

- 1. As overall 3D reconstruction lead, built the full technical architecture from zero to one and independently implemented core code for pose stitching and optimization, point-cloud processing, mesh reconstruction and processing, texture mapping, and LOD.
- 2. Reached 99.99% algorithm-system stability and supported stable reconstruction of very large indoor scenes with 3000+ scan stations.
- 3. Reduced 24K image ISP time from 900s to 6.5s and one VR reconstruction from 20min to 8.5min through end-to-end optimization.
- 4. Built the complete cloud LiDAR SLAM framework supporting large-scale commercial deployment of Beike VR house tours.

Galois P4 Calibration

Technical Solution Design

2024.01-2025.06

Description:

Calibration project for the next-generation 24K VR scanning device Galois P4, solving point-cloud distortion and insufficient point-cloud/image pose accuracy for commercial scanning and reconstruction.

Achievements:

- 1. Led the team in building a system-error evaluation framework, designing targeted hardware calibration solutions, and implementing core calibration code.
- 2. Completed the calibration target, controlling point-cloud/image reprojection error within 4 pixels at original image resolution and resolving long-standing device-accuracy issues.

Indoor Large-Scene Reconstruction

Technical Lead

2023.01-Present

Description:

- 1. Extended 3D reconstruction from Beike VR house tours to libraries, museums, shopping malls, hotels, and other large commercial spaces.

Achievements:

- 1. Designed the overall large-scene reconstruction architecture and built a cloud block-and-merge reconstruction system to solve memory and efficiency bottlenecks.
- 2. Enabled stable reconstruction of 3000-station indoor scenes, supporting commercial 3D reconstruction across multiple industries.

Cloud Post-Processing for LiDAR SLAM

Technical Lead

2023.01-Present

Description:

Developed a cloud SLAM post-processing algorithm system for a handheld scanner, delivering high-precision and high-fidelity reconstruction and visualization.

Achievements:

- 1. Built the overall algorithm pipeline from zero to one and contributed most core code, with a focus on large-scale point-cloud colorization.
- 2. Completed SLAM pose optimization, point-cloud processing, colorization, LOD generation, and mesh reconstruction, improving the company's handheld-scanning reconstruction system.

tSGM-Based Multi-View Dense Matching

Algorithm Engineer

2017.10-2018.06

Description:

- 1. Developed a UAV aerial-image multi-view dense matching algorithm for high-speed, low-memory DSM/DEM generation and orthophoto mosaicking.

Achievements:

- 1. Independently implemented the full tSGM multi-view dense matching algorithm from zero to one using CUDA parallel computing.
- 2. Delivered the algorithm into DSM/DEM generation, orthophoto mosaicking, UAV variable-height flight, and other products.

Oblique Photogrammetry Software

Software Lead

2014.10-2016.10

Description:

- 1. Developed domestic oblique photogrammetry software covering aerial triangulation, dense matching, mesh reconstruction, texture mapping, and LOD generation.

Achievements:

- 1. Led software development and aerial-triangulation algorithms, including feature extraction, image retrieval, feature matching, SfM, control-point BA, and GNSS-constrained BA.
- 2. Delivered Infinite3D-Real Scenes, a domestic oblique photogrammetry reconstruction system for high-precision and high-efficiency large-scene aerial reconstruction.

Airborne LiDAR Point-Cloud Processing Software

Technical Lead

2013.01-2013.12

Description:

- 1. Developed full-process airborne LiDAR point-cloud software for strip adjustment, filtering, vectorized reconstruction, and related processing.

Achievements:

- 1. Completed airborne LiDAR ground filtering with progressive TIN densification, achieving performance and effect comparable to TerraScan.
- 2. Developed LiDAR building vectorization algorithms and delivered a leading domestic 3D vectorized reconstruction software system.

Education

Wuhan University

M.S. Cartography and Geographic Information Systems

2008-2010

Northeast Petroleum University

B.S. Resource Environment and Urban-Rural Planning

2003-2007
