TIANYOU ZHANG

37 Xueyuan Road, Haidian District, Beijing
tianyoubuaa@gmail.com (+86) 18810191299

Ph.D. applicant in Computer Science Engineering related to 3D visual solution for scene perception, action understanding and AR/VR.

EDUCATION

Beihang University Sep 2021 – Jan 2024(expected)

M.S. in Instrument Science and Technology, Key Laboratory of Precision Opto-mechatronics Technology

- GPA: 3.81 / 4
- Core courses: Optimization Method(99), Multiple View Geometry in Computer Vision(94), Intelligence Sensing and Autonomous System(93)

Beihang University Sep 2017 – Jul 2021

B.S. in Instrument Science and Technology

- GPA: 3.72 / 4
- Core courses: Automatic Control Theory(94), Engineering Optics(93), Digital Electronics Technology(97)

RESEARCH EXPERIENCE

6-DoF Pose Estimation and Stereo Depth Estimation Sep 2021 – Present

Research leader Python, PyTorch

- Proposed a novel approach introducing depth information to support surface normals for 6D pose estimation because it integrates 3D scale information and directly suggests objects' positions in the scene. Reached 95.79% in ADD(-S) 0.1d on the LineMOD dataset, outperforming the baseline (GDR-Net) at 93.7%.
- Established a non-ideal binocular stereo measurement system and built a measurement error model to instruct depth estimation. Introduced image super-resolution method to key points extraction and matching tasks, which resolves the feature matching problem of binocular images in different scales.

Expected Publication:
Rethinking Depth and Surface Normals in 6D Pose Estimation

——Under Submission
First Author

Multi-view Images Features Extraction and Reconstruction Mar 2020 – Jan 2021

Research leader Python, PyTorch

- Extracted essential aeroplane structures from single RGB images and reconstructing the structures from three views. Inspired by human pose estimation, the aeroplanes' critical structures are regarded as human skeletons and annotate them in the way of human pose estimation. In the reconstruction process, multiple view geometry was applied in features fusion and got an error at 1.469% in a novel-defined Mean Per Structure Position Error(MPSPE).

PUBLICATION

3D Reconstruction of Aircraft Structures via 2D Multi-view Images

——Proceedings of the SPIE, Volume 12059, id. 120590C 8 pp. (2021).
Zhang, Tianyou ; Fan, Runze ; Zhang, Yu ; Feng, Guangkun ; Wei, Zhenzhong

Selected Honours and Awards

Beihang University Merit Student 2018, 2019
Beihang University Second Prize Scholarship 2018, 2019, 2021
Beihang University Excellent Student Cadre 2017, 2018

Extracurricular Activities

Oral presentation on the 10 th International Symposium on Precision Mechanical Measurement Oct 2021

- Talk about the defination of aircraft's structures and the extracting method inspiring by human pose estimation. Share our method of pose calculation based on PnP algorithm.

Volunteer teaching in primary school Aug 2018

- Teach science and biology in a primary school at rural areas in Gansu Province. Interview and summarize educational difficulties of students there and report their situation for support.

Skills

- Computer vision algorithms: pose estimation, depth prediction, 3D reconstruction, feature extraction
- Precision measurement system: dynamic optoelectronic system, visual track and location system
- Programming: Python > C++ == MATLAB
- Frameworks and Libraries: PyTorch, OpenCV, CUDA
- English: IELTS 7.0