

Yakun Ju

Contact Information

Assistant Professor (UK Lecturer), School of Computing and Mathematical Sciences
611, Ken Edwards Building, University of Leicester, Leicester, LE1 7RH, United Kingdom
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Personal Homepage: <https://juyakun.github.io/>

Research Interests

3D Reconstruction
Computational Imaging
Underwater Information Perception
Medical Image Processing

Education

- 2022 Doctor of Philosophy (Computer Science), Ocean University of China, China with Thesis: “Deep Learning Models for Non-Lambertian Photometric Stereo”
Joint-training PhD with The Hong Kong Polytechnic University, Hong Kong SAR
- 2016 B.Eng., School of Mechanical Engineering, Sichuan University, China

Employment History

- **From 11/2024: Assistant Professor (UK Lecturer), School of Computing and Mathematical Sciences, University of Leicester, United Kingdom**
- 09/2023 – 11/2024: Research Fellow, ROSE Lab, School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore
- 09/2022 – 09/2023: Postdoctoral Fellow, Department of Electronic and Information Engineering, The Hong Kong Polytechnic University, Hong Kong SAR

Publications

Peer Reviewed Journal Articles (* corresponding author)

2026

Zhang, C., Yang, C., **Ju, Y.**, Xiao, J., Jian, M., Lam, KM., Wang, Q. (2026). Dynamic Mutual Learning for Object Detection in Aerial Imagery. *IEEE Transactions on Geoscience and Remote Sensing*.

Liu, X., Xu, H., **Ju, Y.**, Wang, S., Liu, C., Chen, L. (2026). DA-GAN: Dual-Attention GAN for Underwater Image Enhancement With Contrast and Color Correction. *IEEE Transactions on Geoscience and Remote Sensing*.

Fan, G., Zhou, Y., Zhou, J., **Ju, Y.**, Chen, GY., Li, J., Kot, AC. (2026). DCD-UIE: Decoupled Chromatic Diffusion Model for Underwater Image Enhancement. *IEEE Transactions on Image Processing*.

Han, Z., Wu, S., Qiu, J., **Ju, Y.**, Liu, L., Feng, P., Zhou, H., Jiang, Z. (2026). SHARE-U: Semantic-aware Human Avatar Reconstruction with Efficient Gaussians via Uncertainty-weighted Contrastive Learning. *IEEE Transactions on Multimedia*.

2025

Ju, Y., Shi, B., Wen, B., Lam, K.M., Jiang, X., Kot, A.C. (2025). Revisiting One-stage Deep Uncalibrated Photometric Stereo via Fourier Embedding. *IEEE Transactions on Pattern Analysis and Machine Intelligence*.

Ju, Y., Zhao, Y., Xiao, J., Zhang, C., Jiang, Z., Zhou, H., Zhou, W., Yu, H., Dong, J. (2025). Photometric Regularization for 3D Gaussian Splatting in Multi-View Surface Projection. *IEEE Journal of Selected Topics in Signal Processing*.

Ju, Y., Xiao, J., Zhang, C., Xie, H., Luo, A., Zhou, H., Dong, J., Kot, A.C. (2025). Towards marine snow removal with fusing Fourier information. *Information Fusion*.

Ju, Y., Dissanayake, B., Ang, R., Li, L., Sng, D., Kot, A.C. (2025). Face Reconstruction with Detailed Skin Features via Three Selfie Images. *Journal of Visual Communication and Image Representation*.

Yang, Y., Lam, K.M., Dong, J., **Ju, Y***. (2025). Multi-Factor Deep Learning Model for Sea Surface Temperature Forecasting. *Remote Sensing*.

Liu, Y., **Ju, Y.**, Rao, Y., Zhang, S., Fan, H., Qi, L., Dong, J., Gao, F., Du. . (2025). Aerial Multi-View Stereo via Adaptive Depth Range Inference and Normal Cues. *IEEE Transactions on Geoscience and Remote Sensing*.

Wang, J., Li, J., Fan, G., **Ju, Y.**, Fang, X., Kot, AC. (2025). Prototype-driven Structure Synergy Network for Remote Sensing Images Segmentation. *IEEE Transactions on Geoscience and Remote Sensing*.

Xie, H., Huang, Z., Zuo, Y., **Ju, Y.**, Leung, HF., Law, NF., Lam, K., Zheng, YP., Ling, SH. (2025). SA2Net: Scale-adaptive structure-affinity transformation for spine segmentation from ultrasound volume projection imaging. *Computerized Medical Imaging and Graphics*.

Cheng, Z., Wang, W., Chen, GY., **Ju, Y.**, Cheng, Y., Liu, Z., Meng, Y., Song, J. (2025). Excavate the potential of Single-Scale Features: A Decomposition Network for Water-Related Optical Image Enhancement. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*.

Liu, W., Jia, X., Ju, Y., **Ju, Y.**, Jiang, K., Wu, S., Zhong, L., Zhong, X. (2025). Fragrant: Frequency-auxiliary guided relational attention network for low-light action recognition. *The Visual Computer*.

Feng, Y., Li, J., Huang, T., Wu, F., **Ju, Y.**, Li, C., Dong, W., Kot, AC. (2025). Cross-Frequency Attention and Color Contrast Constraint for Remote Sensing Dehazing. *IEEE Transactions on Image Processing*.

2024

Ju, Y., Lam, K.M., Xie, W., Zhou, H., Dong, J., Shi, B. (2024). Deep learning methods for calibrated photometric stereo and beyond. *IEEE Transactions on Pattern Analysis and Machine Intelligence*.

Ju, Y., Li, L., Zhong, X., Rao, Y., Liu, Y., Dong, J., Kot, A.C. (2024). Underwater Surface Normal Reconstruction via Cross-Grained Photometric Stereo Transformer. *IEEE Journal of Oceanic Engineering*.

Ju, Y., Zhou, J., Zhou, S., Xie, H., Zhang, C., Xiao, J., Yang, C., Sun, J. (2024). Three-dimensional reconstruction of underwater side-scan sonar images based on shape-from-shading and monocular depth fusion. *Intelligent Marine Technology and Systems*.

Yang, Y., **Ju, Y.***, Gao, Y., Zhang, C., Lam, K.M. (2024). Remote sensing insights into ocean fronts: A literature review. *Intelligent Marine Technology and Systems*.

Yang, Y., Gao, Y., Sun, X., **Ju, Y.**, Zhang, C., Lam, K.M. (2024). A comprehensive dataset for dynamic analysis of ocean front. *Intelligent Marine Technology and Systems*.

Luo, A., Cai, R., Kong, C., **Ju, Y.**, Kang, X., Huang, J., Life, A.C.K. (2024). Forgery-aware Adaptive Learning with Vision Transformer for Generalized Face Forgery Detection. *IEEE Transactions on Circuits and Systems for Video Technology*.

Lin, X., Tang, W., Wang, H., Liu, Y., **Ju, Y.**, Wang, S., Yu, Z. (2024). Exposing image splicing traces in scientific publications via uncertainty-guided refinement. *Patterns*.

2023

Ju, Y., Shi, B., Chen, Y., Zhou, H., Dong, J., Lam, K.M. (2023). GR-PSN: Learning to estimate surface normal and reconstruct photometric stereo images. *IEEE Transactions on Visualization and Computer Graphics*.

Ju, Y., Jian, M., Wang, C., Zhang, C., Dong, J., Lam, K.M. (2023). Estimating high-resolution surface normals via low-resolution photometric stereo images. *IEEE Transactions on Circuits and Systems for Video Technology*. **ESI Highly Cited Paper**

Zhang, C., Su, J., **Ju, Y.**, Lam, K.M., Wang, Q. (2023). Efficient inductive vision transformer for oriented object detection in remote sensing imagery. *IEEE Transactions on Geoscience and Remote Sensing*. **ESI Highly Cited Paper**

Jian, M., Lu, X., Yu, X., **Ju, Y.**, Yu, H., Lam, K.M. (2023). Flow-Edge-Net: Video saliency detection based on optical flow and edge-weighted balance loss. *IEEE Transactions on Computational Social Systems*.

Luo, K., **Ju, Y.**, Qi, L., Wang, K., Dong, J. (2023). RMAFF-PSN: A residual multi-scale attention feature fusion photometric stereo network. *Photonics*.

Rao, Y., **Ju, Y.**, Li, C., Rigall, E., Yang, J., Fan, H., Dong, J. (2023). Learning general descriptors for image matching with regression feedback. *IEEE Transactions on Circuits and Systems for Video Technology*.

Rao, Y., **Ju, Y.**, Wang, S., Gao, F., Fan, H., Dong, J. (2023). Learning enriched feature descriptor for image matching and visual measurement. *IEEE Transactions on Instrumentation and Measurement*.

2022

Ju, Y., Shi, B., Jian, M., Qi, L., Dong, J., Lam, K.M. (2022). Normattention-PSN: A high-frequency region enhanced photometric stereo network with normalized attention. *International Journal of Computer Vision*.

Ju, Y., Peng, Y., Jian, M., Gao, F., Dong, J. (2022). Learning conditional photometric stereo with high-resolution features. *Computational Visual Media*.

Liu, Y., **Ju, Y.***, Jian, M., Gao, F., Rao, Y., Hu, Y., Dong, J. (2022). A deep-shallow and

global-local multi-feature fusion network for photometric stereo. *Image and Vision Computing*.

Guo, S., Rigall, E., **Ju, Y.**, Dong, J. (2022). 3D hand pose estimation from monocular RGB with feature interaction module. *IEEE Transactions on Circuits and Systems for Video Technology*.

Rao, Y., Yang, J., **Ju, Y.**, Li, C., Rigall, E., Fan, H., Dong, J. (2022). Learning general feature descriptor for visual measurement with hierarchical view consistency. *IEEE Transactions on Instrumentation and Measurement*.

2021 and earlier

Ju, Y., Dong, J., Chen, S. (2021). Recovering surface normal and arbitrary images: A dual regression network for photometric stereo. *IEEE Transactions on Image Processing*.

Ju, Y., Jian, M., Guo, S., Wang, Y., Zhou, H., Dong, J. (2021). Incorporating lambertian priors into surface normals measurement. *IEEE Transactions on Instrumentation and Measurement*.

Ju, Y., Dong, X., Wang, Y., Qi, L., Dong, J. (2020). A dual-cue network for multispectral photometric stereo. *Pattern Recognition*.

Ju, Y., Qi, L., He, J., Dong, X., Gao, F., Dong, J. (2020). MPS-Net: Learning to recover surface normal for multispectral photometric stereo. *Neurocomputing*.

Ju, Y., Qi, L., Zhou, H., Dong, J., Lu, L. (2018). Demultiplexing colored images for multispectral photometric stereo via deep neural networks. *IEEE Access*.

Fan, H., Qi, L., **Ju, Y.**, Dong, J., Yu, H. (2017). Refractive laser triangulation and photometric stereo in underwater environment. *Optical Engineering*.

Peer Reviewed Conference Articles (* corresponding author)

2026

Liu, Z., He, C., **Ju, Y.**, Li, L. (2026). PUFM: Efficient Point Cloud Upsampling via Flow Matching. *Proceedings of the AAAI Conference on Artificial Intelligence*.

2025

Leng, J., **Ju, Y.***, Duan, Y., Zhang, J., Lv, Q., Wu, Z., Fan, H. (2025). FNIN: A Fourier Neural Operator-based Numerical Integration Network for Surface-from-gradients. *Proceedings of the AAAI Conference on Artificial Intelligence*.

Zhu, L., **Ju, Y.**, Gao, Y. (2025). A novel stereo matching network for underwater scenes. *Proceedings of the IEEE International Symposium on Circuits and Systems*.

Li, L., Guo, L., Yang, S., Zheng, Q., **Ju, Y.**, Lin, W., Kot, A.C. (2025). HRHuman: Tuning-free higher-resolution human image generation via template knowledge. *Proceedings of the IEEE International Symposium on Circuits and Systems*.

2024

Xie, H., Huang, Z., Leung, F.H.F., Law, N.F., **Ju, Y.***, Zheng, Y.P., Ling, S.H. (2024). Satr: A structure-affinity attention-based transformer encoder for spine segmentation. *Proceedings of the IEEE International Symposium on Biomedical Imaging*.

Xiao, J., Lyu, Z., Zhang, C., **Ju, Y.**, Shui, C., Lam, K.M. (2024). Towards progressive multi-frequency representation for image warping. *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*.

Xiao, J., Lyu, Z., Xie, H., Zhang, C., **Ju, Y.**, Shui, C., Lam, K.M. (2024). Frequency-aware guidance for blind image restoration via diffusion models. *Proceedings of the European Conference on Computer Vision Workshops*.

Wang, K., Qi, L., Qin, S., Luo, K., **Ju, Y.**, Li, X., Dong, J. (2024). Image gradient-aided photometric stereo network. *Proceedings of the Pacific Rim International Conference on Artificial Intelligence*.

Zhang, C., **Ju, Y.**, Xiao, J., Yang, Y., Lam, K.M. (2024). Aligning localization and classification for anchor-free object detection in aerial imagery. *Proceedings of the International Workshop on Advanced Imaging Technology*.

Xiao, J., Yang, C., Zhang, C., **Ju, Y.**, Lam, K.M. (2024). Dynamic spatial aggregation network for joint denoising and HDR imaging. *Proceedings of the International Workshop on Advanced Imaging Technology*.

2023

Ju, Y., Lam, K.M., Xiao, J., Zhang, C., Yang, C., Dong, J. (2023). Efficient feature fusion for learning-based photometric stereo. *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing*.

Ju, Y., Zhang, C., Huang, S., Rao, Y., Lam, K.M. (2023). Learning deep photometric stereo network with reflectance priors. *Proceedings of the IEEE International Conference on Multimedia and Expo*.

Ju, Y., Jian, M., Zhang, C., Hu, Y., Lam, K.M. (2023). Deep discrete wavelet transform network for photometric stereo. *Proceedings of the International Conference on Digital Signal Processing*.

Xie, H., Huang, Z., Leung, F.H.F., **Ju, Y.***, Zheng, Y.P., Ling, S.H. (2023). A structure-affinity dual attention-based network to segment spine for scoliosis assessment. *Proceedings of the IEEE International Conference on Bioinformatics and Biomedicine*.

Xie, W., Wang, K., **Ju, Y.**, Wang, M. (2023). PMBQA: Projection-based blind point cloud quality assessment via multimodal learning. *Proceedings of the ACM International Conference on Multimedia*.

Zhang, C., Liu, T., **Ju, Y.**, Lam, K.M. (2023). Pyramid masked image modeling for transformer-based aerial object detection. *Proceedings of the IEEE International Conference on Image Processing*.

Yang, C., Xiao, J., **Ju, Y.**, Qiu, G., Lam, K.M. (2023). Improving robustness of single image super-resolution models with Monte Carlo method. *Proceedings of the IEEE International Conference on Image Processing*.

Wang, C., Pan, J., Wang, W., Dong, J., Wang, M., **Ju, Y.**, Chen, J. (2023). Promptrestorer: A prompting image restoration method with degradation perception. *Advances in Neural Information Processing Systems*.

2022 and earlier

Ju, Y., Lam, K.M., Chen, Y., Qi, L., Dong, J. (2020). Pay attention to devils: A photometric stereo network for better details. *Proceedings of the International Joint Conference on Artificial Intelligence*.

Ju, Y., Jian, M., Dong, J., Lam, K.M. (2020). Learning photometric stereo via manifold-based mapping. *Proceedings of the IEEE International Conference on Visual Communications and Image Processing*.

Wang, Y., **Ju, Y.**, Jian, M., Lam, K.M., Qia, L., Dong, J. (2020). Self-supervised depth completion with attention-based loss. *Proceedings of the International Workshop on Advanced Imaging Technology*.

Ju, Y., Qi, L., Fan, H., Lu, L., Dong, J. (2018). Photometric stereo via random sampling and tensor robust principal component analysis. *Proceedings of the International Conference on Graphic and Image Processing*.

Granted Patents

Ju, Y., Dong, J., Qi, L., Lu, L. A single frame image 3D reconstruction device and method based on deep learning. *China Invention Patent*.

Technology Transfer: 480,000 CNY, Approx. 65,800 USD

Ju, Y., Dong, J., Gao, F. High-frequency region enhancement photometric stereo method based on deep learning. *China Invention Patent*.

Ju, Y., Dong, J., Qi, L. Multispectral photometric stereo surface normal recovery method based on deep learning. *China Invention Patent*.

Jian, M., Wang, R., Wang, X., **Ju, Y.**, et al. A transformer-based face image super-resolution method. *China Invention Patent*.

Jian, M., Chen, H., Wang, R., **Ju, Y.**, et al. A method for grading diabetic retinopathy based on a three-stage attention network. *China Invention Patent*.

Jian, M., Wang, R., Wang, X., Chen, J., **Ju, Y.**, et al. Low-resolution face super-resolution and recognition method based on facial prior knowledge. *China Invention Patent*.

Jian, M., Wang, R., Wang, X., Li, C., **Ju, Y.**, et al. Mixed facial component recognition method based on non-uniform illumination face image enhancement. *China Invention Patent*.

Academic Activities

Associate Editor / Editorial Board

Machine Intelligence Research (From 01/2026)

CAAI Transactions on Intelligence Technology (From 08/2025)

Applied Soft Computing (From 02/2025)

Neurocomputing (From 01/2025)

Frontiers in Marine Science (From 03/2025)

Intelligent Marine Technology and Systems (From 12/2023)

Guest Editor

Journal of the Optical Society of America A, *Special Issue: Optics-Driven Computation Models, Algorithms, and Applications* (02/2026-04/2026)

Ocean Engineering, *Special Issue: Multimodal 3D Perception for Underwater Engineering: Acoustics, Optics and Integrated Solutions* (10/2025-04/2026)

Pattern Recognition, *Special Issue: Advances in Multimodal-Driven Video Understanding and Assessment* (04-11/2025)

Computer Vision and Image Understanding, *Special Issue: Advanced Computational Imaging and Photography Measurement* (03-09/2025)

Frontiers in Marine Science, *Special Issue: Underwater Visual Signal Processing in the Data-Driven Era* (10/2024-04/2025)

Remote Sensing, *Special Issue: Remote Sensing Techniques for 3D Reconstruction and Multi-modal Structural Analysis* (01-07/2025)

Conference chair

International Conference on Intelligent Data Analytics and Sustainable Systems (2025), *Conference Program Co-Chair*

International Conference on Intelligent Data Analytics and Sustainable Systems (2024), *Conference Program Co-Chair*

IEEE International Conference on Multimedia and Expo (2023), *Session Chair*

Workshop Organizer

IEEE International Conference on Multimedia and Expo (2026), Physical Principles for Reliable 3D Modelling in Multimedia. *Workshop Chair*

IEEE International Conference on Multimedia and Expo (2025), Multimedia in Underwater Information Processing and Exploration. *Workshop Chair*

ACM Multimedia Asia (2025), Imaging, Processing, Perception, and Reasoning for High-Dimensional Visual Data. *Workshop Chair*

ACM Multimedia (2025), Multimedia Computing for Health and Medicine. *Workshop Program Committee*

IEEE International Conference on Image Processing (2024), AI for Image Processing Applications on Traffic: Advancements, Challenges, and Opportunities. *Workshop Program Committee*

Reviewer

Journal: IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Image Processing, IEEE Transactions on Visualization and Computer Graphics, IEEE Transactions on Multimedia, IEEE Transactions on Circuits and Systems for Video Technology, IEEE Transactions on Consumer Electronics, IEEE Transactions on Industrial Electronics, IEEE Transactions on Computational Imaging, IEEE Transactions on Vehicular Technology, IEEE Journal of Selected Topics in Signal Processing, IEEE Journal of Oceanic Engineering, International Journal of Computer Vision, Engineering Applications of Artificial Intelligence, Optics and Lasers in Engineering, Neurocomputing, Applied Soft Computing, Knowledge-Based Systems, Signal Processing: Image Communication, Neural Computing and Applications, Multimedia Tools and Applications, Computers Materials & Continua, Optics Express, Optical Engineering, Ocean Engineering, Machine Intelligence Research, etc.

Conference: International Conference on Machine Learning, Conference on Computer Vision and Pattern Recognition, International Conference on Computer Vision, ACM Multimedia, International Joint Conference on Artificial Intelligence, International Conference on Medical Image Computing and Computer Assisted Intervention, International Workshop on Advanced

Imaging Technology, IEEE International Conference on Multimedia and Expo, International Conference on Acoustics Speech and Signal Processing, IEEE International Conference on Image Processing, etc.

Tutorial and Talk

Ju, Y. (2025) AI-driven 3D Fundus Reconstruction via Photometric Stereo. *University of Birmingham, UK.*

Ju, Y. (2025) Deep Learning in Medical Image Analysis: Photometric Stereo for Fundus Reconstruction. *University of Leicester, UK.*

Ju, Y. (2024) Implicit GBR Ambiguity Solution in Deep Uncalibrated Photometric Stereo. *Ocean University of China, China.*

Ju, Y. (2024) Photometric Stereo: A dense shape recovery method. *Huazhong University of Science and Technology, China.*

Ju, Y. (2023) Deep Learning-based Calibrated Photometric Stereo: Review & Future. *China 3DV Conference, China.*

Ju, Y. (2023) Recovering surface normal and rerendering images: A dual regression photometric stereo framework. *Shandong Artificial Intelligence Conference, China.*

Ju, Y. (2022) Data-Driven Photometric Stereo. *Shenzhen University, China.*

Ju, Y. (2021) Recent Progress in Data-Driven Photometric Stereo. *CCF China Intelligent Robot Academic Annual Conference, China.*

Teaching

CO7099: Foundations of Cybersecurity, University of Leicester, 2025-2026 SEM2

CO4210/7210: Personal and Group Skills, University of Leicester, 2024-2025 SEM2, 2025-2026 SEM1

CO2302: Software Engineering Group Project, University of Leicester, 2024-2025 SEM2

Supervision

PhD Students:

- Ziang Hao (with Prof. Zhou, H.): Vision-Language Model for Brain Tumor Diagnosis. 2025-2029 University of Leicester

Awards

- 2022 ACM China Council Qingdao Chapter Outstanding Doctoral Dissertation Award
- 2022 Outstanding Graduates of Shandong Province
- 2021 Inspur Scholarship
- 2020 National Scholarship for Doctoral Students
- 2017 Goers Acoustic Scholarship

Grants

- 2024 Research Direct Grant, **PI**
University of Leicester (\$5,000 GBP, Approx. 6,700 USD)
- 2024 Research on Key Technologies of a Lightweight Digital Twin for Dense 3D Surface Based on Normal Map, **Co-PI**
National Natural Science Foundation of China (\$500,000 CNY, Approx. 69,400 USD)
- 2025 Unravelling Organoid Heterogeneity and Drug Response with a Novel Foundation Model, **Co-supervisor, with AstraZeneca UK**
EPSRC IDLA PhD Studentship (143,000 GBP, Approx. 193,000 USD)

Appendix: Biography



Yakun Ju has been an Assistant Professor (UK Lecturer) in the School of Computing and Mathematical Sciences at the University of Leicester, United Kingdom, since 2024. He has served as an Associate Editor or Editorial Board member of several leading journals, including MIR, CAAI TRIT, ASOC, and Neurocomputing, and as a Guest Editor of JOSA A, PR, CVIU, and OE.

Before joining Leicester, he worked as a Research Fellow in the ROSE Lab at Nanyang Technological University, Singapore (2023–2024), collaborating with Prof. Alex Chichung Kot (SAEng, IEEE Life Fellow). Prior to that, he was a Postdoctoral Fellow at The Hong Kong Polytechnic University, Hong Kong SAR (2022–2023), working with Prof. Kin-Man Lam (Vice President, IEEE Signal Processing Society). He received his Ph.D. in Computer Science from Ocean University of China in 2022, supervised by Prof. Junyu Dong (National High-Level Talent Programs - Leading Talents). He received the B.Eng. degree from Sichuan University in 2016.

Dr. Ju's research interests include 3D reconstruction, photometric stereo, computational imaging, and underwater visual perception. His work emphasizes physically grounded and learning-based methods for dense geometry recovery and reflectance analysis in challenging environments, including underwater and medical scenes. He has authored over 70 peer-reviewed publications in leading journals and conferences such as TPAMI, TVCG, TIP, IJCV, NeurIPS, and CVPR, and holds multiple China national patents related to deep learning-based 3D surface reconstruction, which have supported technology transfer applications exceeding 400,000 CNY (approximately 55,000 USD).