YIFU WANG

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Working Experience

XR Vision Labs at Tencent — Canberra, Australia
Senior Researcher — *Aug. 2022 – now*

SIMIT & ShanghaiTech University — Shanghai, China
Postdoctoral Researcher — *Apr. 2021 – Jul. 2022*

Motovis Intelligent Technologies — Shanghai, China
SLAM Technical Consultant — *Nov. 2021 – Jul. 2022*

Education

Australian National University — Australia
Doctor of Philosophy, Engineering and Computer Science — *Mar. 2016 – Apr. 2021*
- Advisor: Prof. Laurent Kneip

Australian National University — Australia
B. Eng. Hons Electronics and Communications — *Feb. 2014 – Dec. 2015*

Beijing Institute of Technology — China
B. Eng. Automation — *Sep. 2011 – Jun. 2016*

Research Experience

Extrinsic calibration for multi-perspective cameras — Aug 2021 – Sep 2021
Published paper in ICRA 2022
- present a novel closed-form solution for multi-handeye calibration problem
- introduce a practical, simple and accurate extrinsic calibration procedure
- validated on non-overlapping multi-camera systems and outperforms existing solutions

Visual odometry with a Stereo Depth-Event Camera — May 2021 – Sep 2021
Published paper in ICRA 2022
- generate semi-dense 3d map by using modified time-surface map and depth info
- tracking with 2d-3d alignment strategy
- validated on 6-dof motion estimation case and outperforms regular RGB-D based solutions

Volumetric contrast maximization for event camera — Jan 2020 – Oct 2020
Published paper in Sensors 2022
- contrast maximization is restricted to a image-to-image warping function
- maximizes the contrast via smooth motion parameters in a volumetric ray density field
- validated on AGV motion estimation case and outperforms regular camera solution

Motion estimation for surround-view camera systems — Dec. 2018 – Jun. 2019
Published paper in ICRA 2020
- a generalized planar motion solver for multiple cameras appears as a gap in the literature
- formulates epipolar geometry as an uni-variate, multi-eigenvalue minimization problem
- presents a highly accurate and reliable motion estimation for surround-view camera systems

Visual odometry for non-overlapping multi-camera systems — Apr. 2016 – Mar. 2017
Published paper in ICVS 2017
- non-overlapping multi-camera systems are easily affected by motion degeneracies that cause scale unobservabilities
- solves scaled translations and point depths through a closed-form, linear initialization approach
- presents a novel initialization method and a complete pipeline for non-overlapping MPC systems

Publications

Y Wang*, W. Jiang*, K. Huang, S. Schwertfeger, L. Kneip, Accurate calibration of multi-perspective cameras from a generalization of the hand-eye constraint, *In Proceedings of the 2022 IEEE International conference on robotics and automation (ICRA)* **(co-first author)**

Y. Zuo*, J. Yang*, J. Chen, X. Wang, **Y Wang**[#] and L. Kneip[#], DEVO: Depth-Event Camera Visual Odometry in Challenging Conditions, *In Proceedings of the 2022 IEEE International conference on robotics and automation (ICRA)* **(corresponding author)**

Y Wang, J. Yang, X. Peng, P. Wu, L. Gao, K. Huang, J. Chen, and L. Kneip, Visual odometry with an event camera using continuous ray warping and volumetric contrast maximization. *Sensors*, 2022.

K Huang, **Y Wang** and L Kneip. Dynamic Event Camera Calibration, *In Proceedings of the 2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2021)*, Sep. 2021.

K Huang, **Y Wang** and L Kneip. B-splines for Purely Vision-based Localization and Mapping on Non-holonomic Ground Vehicles, *In Proceedings of the 2021 IEEE International conference on robotics and automation (ICRA)*, Jun. 2021.

X. Peng, L. Gao, **Y Wang** and L. Kneip. Globally-Optimal Contrast Maximisation for Event Cameras, *In IEEE Transactions on Pattern Analysis and Machine Intelligence*, Jan. 2021.

X Peng*, **Y Wang***, L Gao* and L Kneip. Globally-Optimal Event Camera Motion Estimation. *In Proceedings of the European Conference on Computer Vision (ECCV)*, Aug. 2020. **(co-first author)**

Y Wang, K Huang, X Peng, H Li and L Kneip. Reliable frame-to-frame motion estimation for vehicle-mounted surround-view camera systems. *In Proceedings of the 2020 IEEE International conference on robotics and automation (ICRA)*, Jun. 2020.

K Huang, **Y Wang** and L Kneip. Motion estimation of non-holonomic ground vehicles from a single feature correspondence measured over n views. *In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Jun. 2019.

Y Wang and L Kneip. On scale initialization in non-overlapping multi-perspective visual odometry. *In Proceedings of the International Conference on Computer Vision Systems*, Shenzhen, Jul 2017. **Best Student Paper Award**

Internship and Visiting history

SLAM Technical Consultant Oct. 2020 – Oct. 2021
Stereye Intelligent Technologies *Shanghai, China*

- Part-time technical consultant at SLAM Group of Stereye Intelligent Technologies.

Visiting Researcher Jul. 2018 – Present
ShanghaiTech University *Shanghai, China*

Intern Jul 2019 –Aug 2019
Motovis Intelligent Technologies *Shanghai, China*

- Internship at v-SLAM Group of Motovis Intelligent Technologies.

Honors and Awards

Third Prize Winner Dec 2020
3rd Innovation and Entrepreneurship Summit of ShhanghaiTech University

- Our project **"ARGUS.AI: Super vision for machines"** won 10,000 CNY in startup funds.

Best Student Paper Award Jul 2017
International Conference on Computer Vision Systems 2017

Skills

Programming Skills: C/C++, Matlab, TeX
Languages: Mandarin, English
Platforms Tools: Windows, Ubuntu, Mac OS.
General Business Skills: Strong sense of responsibility, good at communication and team work.