

# YIFU WANG

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## Working Experience

### ShanghaiTech University & SIMIT

*Postdoctoral Researcher*

Shanghai, China

Apr. 2021 – Now

### Motovis Intelligent Technologies

*SLAM Technical Consultant*

Shanghai, China

Nov. 2021 – Now

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## Education

### Australian National University

*Doctor of Philosophy, Engineering and Computer Science*

Australia

Mar. 2016 – Nov. 2020

- Advisor: Prof. Laurent Kneip

### Australian National University

*B. Eng. Hons Electronics and Communications*

Australia

Feb. 2014 – Dec. 2015

### Beijing Institute of Technology

*B. Eng. Hons Automation*

China

Sep. 2011 – Jul. 2015

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## 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

*On Arxiv now*

- 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

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## 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<sup>#</sup>** and L. Kneip<sup>#</sup>, 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. *arXiv preprint arXiv:2107.03011*, 2021.

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**

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## Internship and Visiting history

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|---|---|
| <b>SLAM Technical Consultant</b><br><i>Stereeye Intelligent Technologies</i> <ul style="list-style-type: none"><li>Part-time technical consultant at SLAM Group of Stereeye Intelligent Technologies.</li></ul> | Oct. 2020 – Oct. 2021<br><i>Shanghai, China</i> |
| <b>Visiting Researcher</b><br><i>ShanghaiTech University</i>  | Jul. 2018 – Present<br><i>Shanghai, China</i>   |
| <b>Intern</b><br><i>Motovis Intelligent Technologies</i> <ul style="list-style-type: none"><li>Internship at v-SLAM Group of Motovis Intelligent Technologies.</li></ul>  | Jul 2019 –Aug 2019<br><i>Shanghai, China</i>    |

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## Honors and Awards

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| <b>Third Prize Winner</b><br><i>3rd Innovation and Entrepreneurship Summit of ShhanghaiTech University</i> <ul style="list-style-type: none"><li>Our project “<b>ARGUS.AI: Super vision for machines</b>” won 10,000 CNY in startup funds.</li></ul> | Dec 2020 |
| <b>Best Student Paper Award</b><br><i>International Conference on Computer Vision Systems 2017</i>   | Jul 2017 |

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## 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.