

I published most of my work at top international conferences in robotics and computer vision. Due to acceptance rates around 25% only, publications at top computer vision conferences such as the IEEE Conference on Computer Vision and Pattern Recognition (CVPR) are considered an outstanding achievement comparable to publications in top journals in the field.

Peer-reviewed journal publications

- D Scaramuzza, M C Achtelik, L Doitsidis, F Fraundorfer, E B Kosmatopoulos, A Martinelli, M W Achtelik, M Chli, S A Chatzichristofis, **L Kneip**, D Gurdan, L Heng, G H Lee, S Lynen, L Meier, M Pollefeys, A Renzaglia, R Siegwart, J C Stumpf, P Tanskanen, C Troiani, and S Weiss. Vision-controlled micro flying robots: from system design to autonomous navigation and mapping in GPS-denied environments. *IEEE Robotics and Automation Magazine*, 21(3):26–40, 2014
- S Weiss, M W Achtelik, S Lynen, M C Achtelik, **L Kneip**, M Chli, and R Siegwart. Monocular vision for long-term micro aerial vehicle state estimation: A compendium. *Journal of Field Robotics (JFR)*, 30(5):803–831, 2013
- S Weiss, M Achtelik, **L Kneip**, D Scaramuzza, and R Siegwart. Intuitive 3d maps for mav terrain exploration and obstacle avoidance. *Journal of Intelligent Robotics Systems*, 61(1–4):473–493, 2011
- **L Kneip** and C Baumann. Binaural model for artificial spatial sound localization based on interaural time delays and movements of the interaural axis. *AIP Journal of the Acoustical Society of America*, 124(5):3108–3119, 2008

Peer-reviewed conference publications

2017

- D Campbell, L Petersson, **L Kneip**, and H Li. Globally-Optimal Inlier Set Maximisation for Simultaneous Camera Pose and Feature Correspondence. In *Proceedings of the International Conference on Computer Vision (ICCV)*, Venice, Italy, October 2017. Marr Prize Honourable Mention
- M Ramezani, K Koshelham, and **L Kneip**. Omnidirectional Visual-Inertial Odometry Using Multi-State Constraint Kalman Filter. In *Proceedings of the IEEE/RSJ Conference on Intelligent Robots and Systems (IROS)*, Vancouver, Canada, September 2017
- 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, July 2017a. Best Student Paper Award
- Z Wang and **L Kneip**. Towards Space Carving with a Hand-held Camera. In *Proceedings of the International Conference on Computer Vision Systems*, Shenzhen, July 2017b
- Y Zhou, **L Kneip**, and H Li. Semi-dense Visual Odometry for RGB-D Cameras using Approximate Nearest Neighbour Fields. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Singapore, May 2017

2016

- G Long, **L Kneip**, J M Alvarez, H Li, X Zhang, and Q Yu. Learning Image Matching by Simply Watching Video. In *Proceedings of the European Conference on Computer Vision (ECCV)*, Amsterdam, Netherlands, October 2016b
- Y Zhou, **L Kneip**, and H Li. Real-Time Rotation Estimation for Dense Depth Sensors in Piece-wise Planar Environments. In *Proceedings of the IEEE/RSJ Conference on Intelligent Robots and Systems (IROS)*, Deajeon, Korea, October 2016
- S H Namin, J Alvarez, **L Kneip**, and L Petersson. Latent Structural SVM with Marginal Probabilities for Weakly Labeled Structured Learning. In *Proceedings of the IEEE International Conference on Image Processing (ICIP)*, Phoenix, USA, September 2016
- H Zhang, X He, F Porikli, and **L Kneip**. Semantic context and depth-aware object proposal generation. In *Proceedings of the IEEE International Conference on Image Processing (ICIP)*, Phoenix, USA, September 2016
- Y Dai, H Li, and **L Kneip**. Rolling shutter camera relative pose: Generalized epipolar geometry. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Las Vegas, USA, June 2016
- Y Zheng and **L Kneip**. A direct least-squares solution to the pnp problem with unknown focal length. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Las Vegas, USA, June 2016
- **L Kneip**, C Sweeney, and R Hartley. The generalized relative pose and scale problem: View-graph fusion via 2D-2D registration. In *Proceedings of the IEEE Winter Conference on Applications of Computer Vision*, Lake Placid, USA, March 2016. Accepted for publication

2015

- Y Zhou, **L Kneip**, and H Li. A revisit of methods for determining the fundamental matrix with planes. In *Proceedings of the Digital Image Computing on Techniques and Applications (DICTA)*, Adelaide, Australia, November 2015
- **L Kneip**, Y Zhou, and H Li. SDICP: Semi-dense tracking based on iterative closest points. In *Proceedings of the British Machine Vision Conference (BMVC)*, Swansea, UK, August 2015
- C Sweeney, **L Kneip**, T Höllerer, and M Turk. Computing similarity transformations from only image correspondences. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Boston, USA, June 2015
- G Long, **L Kneip**, X Li, X Zhang, and Q Yu. Simplified mirror-based camera pose computation via rotation averaging. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Boston, USA, June 2015

2014

- **L Kneip**, H Li, and Y Seo. UPnP: An optimal $O(n)$ solution to the absolute pose problem with universal applicability. In *Proceedings of the European Conference on Computer Vision (ECCV)*, Zurich, Switzerland, September 2014
- **L Kneip** and H Li. Efficient computation of relative pose for multi-camera systems. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Columbus, USA, June 2014
- **L Kneip** and P Furgale. OpenGV: A unified and generalized approach to calibrated geometric vision. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Hong Kong, China, May 2014

2013

- **L Kneip** and S Lynen. Direct optimization of frame-to-frame rotation. In *Proceedings of the International Conference on Computer Vision (ICCV)*, Sydney, Australia, December 2013
- C Forster, S Lynen, **L Kneip**, and D Scaramuzza. Collaborative monocular SLAM with multiple micro aerial vehicles. In *Proceedings of the IEEE/RSJ Conference on Intelligent Robots and Systems (IROS)*, Tokyo, Japan, November 2013 [Video]
- L Oth, P T Furgale, **L Kneip**, and R Siegwart. Rolling shutter camera calibration. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Portland, USA, June 2013
- **L Kneip**, P Furgale, and R Siegwart. Using multi-camera systems in robotics: efficient solutions to the NPNP problem. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Karlsruhe, Germany, May 2013. Best computer vision paper finalist

2012

- M Achtelik, S Lynen, S Weiss, **L Kneip**, M Chli, and R Siegwart. Visual-inertial SLAM for a small helicopter in large outdoor environments. In *Proceedings of the IEEE/RSJ Conference on Intelligent Robots and Systems (IROS)*, Vila Moura, Portugal, October 2012b [Video]
- M Achtelik, M Achtelik, Y Brunet, M Chli, S Chatzichristofis, J Decotignie, K Doth, F Fraundorfer, **L Kneip**, D Gurdan, L Heng, E Kosmatopoulos, L Doitsidis, G Lee, S Lynen, A Martinelli, L Meier, M Pollefeys, D Piguet, A Renzaglia, D Scaramuzza, R Siegwart, J Stumpf, P Tanskanen, C Troiani, and S Weiss. sFly: swarm of micro flying robots. In *Proceedings of the IEEE/RSJ Conference on Intelligent Robots and Systems (IROS)*, Vila Moura, Portugal, October 2012a. Best video paper finalist [Video]
- **L Kneip**, R Siegwart, and M Pollefeys. Finding the exact rotation between two images independently of the translation. In *Proceedings of the European Conference on Computer Vision (ECCV)*, Firenze, Italy, October 2012
- T Kazik, **L Kneip**, J Nikolic, M Pollefeys, and R Siegwart. Real-time 6D stereo visual odometry with non-overlapping fields of view. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Providence, USA, June 2012 [Video]

2011

- A Breitenmoser, **L Kneip**, and R Siegwart. A monocular vision-based system for 6D relative robot localization. In *Proceedings of the IEEE/RSJ Conference on Intelligent Robots and Systems (IROS)*, San Francisco, USA, September 2011
- R Voigt, J Nikolic, C Hürzeler, S Weiss, **L Kneip**, and R Siegwart. Robust embedded egomotion estimation. In *Proceedings of the IEEE/RSJ Conference on Intelligent Robots and Systems (IROS)*, San Francisco, USA, September 2011
- **L Kneip**, S Weiss, and R Siegwart. Deterministic initialization of metric state estimation filters for loosely-coupled monocular vision-inertial systems. In *Proceedings of the IEEE/RSJ Conference on Intelligent Robots and Systems (IROS)*, San Francisco, USA, September 2011d

- **L Kneip**, M Chli, and R Siegwart. Robust real-time visual odometry with a single camera and an IMU. In *Proceedings of the British Machine Vision Conference (BMVC)*, Dundee, Scotland, August 2011a [Video]
- **L Kneip**, D Scaramuzza, and R Siegwart. A novel parametrization of the perspective-three-point problem for a direct computation of absolute camera position and orientation. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Colorado Springs, USA, June 2011c
- **L Kneip**, A Martinelli, S Weiss, D Scaramuzza, and R Siegwart. Closed-form solution for absolute scale velocity determination combining inertial measurements and a single feature correspondence. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Shanghai, China, May 2011b

2010

- **L Kneip**, D Scaramuzza, and R Siegwart. On the initialization of statistical optimum filters with application to motion estimation. In *Proceedings of the IEEE/RSJ Conference on Intelligent Robots and Systems (IROS)*, Taipei, Taiwan, October 2010

2009

- **L Kneip**, F Tache, G Caprari, and R Siegwart. Characterization of the compact hokuyo URG-04LX 2D laser range scanner. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Kobe, Japan, May 2009

Contributions to books

- F Bourgeois, **L Kneip**, S Weiss, and R Siegwart. Delay and dropout tolerant state estimation for MAVs. In O Khatib, V Kumar, and G Sukhatme, editors, *Experimental Robotics*, volume 79 of *Springer Tracts in Advanced Robotics*, pages 571–584. Springer, 2014

Other publications

- G Long, **L Kneip**, J M Alvarez, and H Li. Learning image matching by simply watching video. *ArXiv e-prints*, 2016a
- C Forster, S Lynen, **L Kneip**, and R Siegwart. Collaborative visual slam with multiple mavs. In *Workshop on Integration of Perception and Control for Resource-Limited, Highly Dynamic, Autonomous Systems (RSS)*, Sydney, Australia, July 2012
- C Baumann and **L Kneip**. Stereo-Hör-Sensor. *Elektor Magazine*, page 14, 2007

Thesis

- **L Kneip**. *Real-Time Scalable Structure from Motion: From Fundamental Geometric Vision to Collaborative Mapping*. PhD thesis, ETH Zurich, 2012. ETH Dissertation No. 20628