2022

Journal Articles

[J1] L. von Stumberg and D. Cremers,
DM-VIO: Delayed Marginalization Visual-Inertial Odometry,

Conference and Workshop Papers

[C1] D Muhle, L Koestler, N Demmel, F Bernard and D Cremers,
The Probabilistic Normal Epipolar Constraint for Frame-To-Frame Rotation Optimization under Uncertain Feature Positions,
*IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2022.

[C2] S Weber, N Demmel, T Chon Chan and D Cremers,
Power Bundle Adjustment for Large-Scale 3D Reconstruction,
*submission*, 2022.

[C3] M Gladkova, N Korobov, N Demmel, A Osep, L Leal-Taixe and D Cremers,
DirectTracker: 3D Multi-Object Tracking Using Direct Image Alignment and Photometric Bundle Adjustment,

2021

Journal Articles

[J1] J. Chui, S. Klenk and D. Cremers,
Event-Based Feature Tracking in Continuous Time with Sliding Window Optimization,

Conference and Workshop Papers

[C1] F. Wimbauer, N. Yang, L. von Stumberg, N. Zeller and D Cremers,
MonoRec: Semi-Supervised Dense Reconstruction in Dynamic Environments from a Single Moving Camera,
*IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021.

[C2] M Gladkova, R Wang, N Zeller and D Cremers,
Tight Integration of Feature-based Relocalization in Monocular Direct Visual Odometry,

[C3] Y. Xia, Y. Xu, S. Li, R. Wang, J. Du, D. Cremers and U. Stilla,
SOE-Net: A Self-Attention and Orientation Encoding Network for Point Cloud based Place Recognition,
*IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021, *Oral Presentation*. 

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[C4] N Demmel, C Sommer, D Cremers and V Usenko, 
**Square Root Bundle Adjustment for Large-Scale Reconstruction**,  
*IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021.

[C5] N Demmel, D Schubert, C Sommer, D Cremers and V Usenko,  
**Square Root Marginalization for Sliding-Window Bundle Adjustment**,  

[C6] MW Wudena, MG Müller, N Demmel, A Wedler, R Triebel, D Cremers and W Stuerzl,  
**Towards Robust Monocular Visual Odometry for Flying Robots on Planetary Missions**,  

[C7] S Klenk, J Chui, N Demmel and D Cremers,  
**TUM-VIE: The TUM Stereo Visual-Inertial Event Dataset**,  

[C8] L Koestler, N Yang, N Zeller and D Cremers,  
**TANDEM: Tracking and Dense Mapping in Real-time using Deep Multi-view Stereo**,  
*Conference on Robot Learning (CoRL)*, 2021, 3DV’21 Best Demo Award.

[C9] S Weber, N Demmel and D Cremers,  
**Multidirectional Conjugate Gradients for Scalable Bundle Adjustment**,  
*German Conference on Pattern Recognition (GCPR)*, 2021, Oral Presentation.

2020

Journal Articles

[J1] V. Usenko, N. Demmel, D. Schubert, J. Stueckler and D. Cremers,  
**Visual-Inertial Mapping with Non-Linear Factor Recovery**,  

[J2] L. von Stumberg, P. Wenzel, Q. Khan and D. Cremers,  

Conference and Workshop Papers

[C1] R. Wang, N. Yang, J. Stueckler and D. Cremers,  
**DirectShape: Photometric Alignment of Shape Priors for Visual Vehicle Pose and Shape Estimation**,  

[C2] C. Sommer, V. Usenko, D. Schubert, N. Demmel and D. Cremers,  
**Efficient Derivative Computation for Cumulative B-Splines on Lie Groups**,  
*IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020, Oral Presentation.

[C3] N. Yang, L. von Stumberg, R. Wang and D. Cremers,  
**D3VO: Deep Depth, Deep Pose and Deep Uncertainty for Monocular Visual Odometry**,  
*IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020, Oral Presentation.
[C4] J. Du, R. Wang and D. Cremers,  
**DH3D: Deep Hierarchical 3D Descriptors for Robust Large-Scale 6DoF Relocalization,**  
*European Conference on Computer Vision (ECCV)*, 2020, **Spotlight Presentation.**

**4Seasons: A Cross-Season Dataset for Multi-Weather SLAM in Autonomous Driving,**  

[C6] N Demmel, M Gao, E Laude, T Wu and D Cremers,  
**Distributed Photometric Bundle Adjustment,**  
*International Conference on 3D Vision (3DV)*, 2020, **Oral Presentation.**

[C7] L. von Stumberg, P. Wenzel, N. Yang and D. Cremers,  
**LM-Reloc: Levenberg-Marquardt Based Direct Visual Relocalization,**  

**2019**

**Conference and Workshop Papers**

[C1] D. Schubert, N. Demmel, L. von Stumberg, V. Usenko and D. Cremers,  
**Rolling-Shutter Modelling for Visual-Inertial Odometry,**  

[C2] F. Steidle, W. Stürzl and R. Triebel,  
**Visual-inertial sensor fusion with a bio-inspired polarization compass for navigation of MAVs,**  

**2018**

**Journal Articles**

[J1] J. Engel, V. Koltun and D. Cremers,  
**Direct Sparse Odometry,**  

[J2] N. Yang, R. Wang, X. Gao and D. Cremers,  
**Challenges in Monocular Visual Odometry: Photometric Calibration, Motion Bias and Rolling Shutter Effect,**  

[J3] P. Bergmann, R. Wang and D. Cremers,  
**Online Photometric Calibration of Auto Exposure Video for Realtime Visual Odometry and SLAM,**  
*IEEE Robotics and Automation Letters (RA-L)*, 3: 627-634, April 2018, **ICRA’18 Best Vision Paper Award - Finalist.**

**Omnidirectional DSO: Direct Sparse Odometry with Fisheye Cameras,**  
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[C1] C. Sommer and D. Cremers,
*Joint Representation of Primitive and Non-primitive Objects for 3D Vision*,

[C2] R Scona, M Jaimez, YR. Petillot, M Fallon and D Cremers,
*StaticFusion: Background Reconstruction for Dense RGB-D SLAM in Dynamic Environments*,

[C3] L. von Stumberg, V. Usenko and D. Cremers,
*Direct Sparse Visual-Inertial Odometry using Dynamic Marginalization*,

*The TUM VI Benchmark for Evaluating Visual-Inertial Odometry*,

[C5] X. Gao, R. Wang, N. Demmel and D. Cremers,
*LDSO: Direct Sparse Odometry with Loop Closure*,

[C6] N. Yang, R. Wang, J. Stueckler and D. Cremers,
*Deep Virtual Stereo Odometry: Leveraging Deep Depth Prediction for Monocular Direct Sparse Odometry*,

[C7] D. Schubert, N. Demmel, V. Usenko, J. Stueckler and D. Cremers,
*Direct Sparse Odometry With Rolling Shutter*,

[C8] V. Usenko, N. Demmel and D. Cremers,
*The Double Sphere Camera Model*,

2017 Conference and Workshop Papers

[C1] G. Kuschk, A. Bozic and D. Cremers,
*Real-time variational stereo reconstruction with applications to large-scale dense SLAM*,

[C2] M. Dzitsiuk, J. Sturm, R. Maier, L. Ma and D. Cremers,
*De-noising, Stabilizing and Completing 3D Reconstructions On-the-go using Plane Priors*,
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[C3] L. von Stumberg, V. Usenko, J. Engel, J. Stueckler and D. Cremers,
*From Monocular SLAM to Autonomous Drone Exploration*,

[C4] R. Maier, R. Schaller and D. Cremers,
*Efficient Online Surface Correction for Real-time Large-Scale 3D Reconstruction*,

[C5] A. Kasyanov, F. Engelmann, J. Stueckler and B. Leibe,
*Keyframe-Based Visual-Inertial Online SLAM with Relocalization*,

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[C1] V. Usenko, J. Engel, J. Stueckler and D. Cremers,
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[C2] L. Ma, C. Kerl, J. Stueckler and D. Cremers,
*CPA-SLAM: Consistent Plane-Model Alignment for Direct RGB-D SLAM*,

[C3] J. Engel, V. Usenko and D. Cremers,
*A Photometrically Calibrated Benchmark For Monocular Visual Odometry*,

[C4] J. Engel, V. Koltun and D. Cremers,
*Direct Sparse Odometry*,

[C5] D. Bender, F. Rouatbi, M. Schikora, D. Cremers and W. Koch,
*Scaling the world of monocular SLAM with INS-measurements for UAS navigation*,

2015

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[J1] M. Jaimez and J. Gonzalez-Jimenez,
*Fast Visual Odometry for 3-D Range Sensors*,

[J2] D. Droeschel, M. Nieuwenhuisen, M. Beul, J. Stueckler, D. Holz and S. Behnke,
*Multi-Layered Mapping and Navigation for Autonomous Micro Aerial Vehicles*,

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[C1] J. Engel, J. Stueckler and D. Cremers,
*Large-Scale Direct SLAM with Stereo Cameras*,
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[C2] D. Caruso, J. Engel and D. Cremers,
Large-Scale Direct SLAM for Omnidirectional Cameras,

[C3] V. Usenko, J. Engel, J. Stueckler and D. Cremers,
Reconstructing Street-Scenes in Real-Time From a Driving Car,

[C4] C. Kerl, J. Stueckler and D. Cremers,
Dense Continuous-Time Tracking and Mapping with Rolling Shutter RGB-D Cameras,
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2014

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[J1] J. Engel, J. Sturm and D. Cremers,
Scale-Aware Navigation of a Low-Cost Quadrocopter with a Monocular Camera,

[J2] J. Stueckler and S. Behnke,
Multi-Resolution Surfel Maps for Efficient Dense 3D Modeling and Tracking,

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[C1] D. B. AD. CJ. C D. Weikersdorfer,
Event-based 3D SLAM with a depth-augmented dynamic vision sensor,

[C2] F. Steinbruecker, J. Sturm and D. Cremers,
Volumetric 3D Mapping in Real-Time on a CPU,

[C3] H. Alvarez, L.M. Paz, J. Sturm and D. Cremers,
Collision Avoidance for Quadrotors with a Monocular Camera,

[C4] J. Engel, T. Schöps and D. Cremers,
LSD-SLAM: Large-Scale Direct Monocular SLAM,
*European Conference on Computer Vision (ECCV)*, September 2014, Oral Presentation.

[C5] T. Schöps, J. Engel and D. Cremers,
Semi-Dense Visual Odometry for AR on a Smartphone,

[C6] R. Maier, J. Sturm and D. Cremers,
Submap-based Bundle Adjustment for 3D Reconstruction from RGB-D Data,
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[C7] O. Dunkley, J. Engel, J. Sturm and D. Cremers,
Visual-Inertial Navigation for a Camera-Equipped 25g Nano-Quadrotor,

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Local Multi-Resolution Surfel Grids for MAV Motion Estimation and 3D Mapping,

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[M1] T Schöps,
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Technical University Munich, Germany, May 2014.

[M2] M. Shelley,
Monocular Visual Inertial Odometry on a Mobile Device,
Technical University Munich, Germany, Aug. 2014.

[M3] OMW Dunkley,
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Technical University Munich, Germany, Sept. 2014.

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[J1] F. Endres, J. Hess, J. Sturm, D. Cremers and W. Burgard,
3D Mapping with an RGB-D Camera,

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[C1] C. Kerl, J. Sturm and D. Cremers,
Robust Odometry Estimation for RGB-D Cameras,
International Conference on Robotics and Automation (ICRA), May 2013, Best Vision Paper Award - Finalist.

[C2] E. Bylow, J. Sturm, C. Kerl, F. Kahl and D. Cremers,
Real-Time Camera Tracking and 3D Reconstruction Using Signed Distance Functions,
Keywords: Slam

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[C3] E. Bylow, J. Sturm, C. Kerl, F. Kahl and D. Cremers,
Direct Camera Pose Tracking and Mapping With Signed Distance Functions,
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Dense Visual SLAM for RGB-D Cameras,

[C5] J. Sturm, E. Bylow, F. Kahl and D. Cremers,
Dense Tracking and Mapping with a Quadrocopter,
Unmanned Aerial Vehicle in Geomatics (UAV-g), Rostock, Germany, September 2013.

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Large-Scale Multi-Resolution Surface Reconstruction from RGB-D Sequences,
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[C8] M. Schadler, J. Stueckler and S. Behnke,
Multi-resolution surfel mapping and real-time pose tracking using a continuously rotating 2D laser scanner,

[C9] M. McElhone, J. Stueckler and S. Behnke,
Joint detection and pose tracking of multi-resolution surfel models in RGB-D,

[C10] J. Stueckler and S. Behnke,
Hierarchical Object Discovery and Dense Modelling From Motion Cues in
RGB-D Video,

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[M1] R. Maier,
Out-of-Core Bundle Adjustment for 3D Workpiece Reconstruction,
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[C1] F. Endres, J. Hess, N. Engelhard, J. Sturm, D. Cremers and W. Burgard,
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[C2] J. Engel, J. Sturm and D. Cremers,
Camera-Based Navigation of a Low-Cost Quadrocopter,
Keywords: Slam

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[C3] J. Sturm, N. Engelhard, F. Endres, W. Burgard and D. Cremers,
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2011
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