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List of Publications

2021
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.

[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.

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,
GN-Net: The Gauss-Newton Loss for Multi-Weather Relocalization,

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.
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[C4] J. Du, R. Wang and D. Cremers, 
**DH3D: Deep Hierarchical 3D Descriptors for Robust Large-Scale 6DoF Relocalization**, 

[C5] N Demmel, M Gao, E Laude, T Wu and D Cremers, 
**Distributed Photometric Bundle Adjustment**, 

[C6] L. von Stumberg, P. Wenzel, N. Yang and D. Cremers, 
**LM-Reloc: Levenberg-Marquardt Based Direct Visual Relocalization**, 

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

2019

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[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. Treibel, 
**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**, 

**Omnidirectional DSO: Direct Sparse Odometry with Fisheye Cameras**, 
Keywords: Slam
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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,
International Conference on Robotics and Automation (ICRA), May 2018.

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,
European Conference on Computer Vision (ECCV), September 2018, Oral Presentation.

[C7] D. Schubert, N. Demmel, V. Usenko, J. Stueckler and D. Cremers,
Direct Sparse Odometry With Rolling Shutter,
European Conference on Computer Vision (ECCV), September 2018, Oral Presentation.

[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,
Keywords: Slam

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[C3] L. von Stumberg, V. Usenko, J. Engel, J. Stueckler and D. Cremers,
From Monocular SLAM to Autonomous Drone Exploration,
European Conference on Mobile Robots (ECMR), September 2017.

[C4] R. Maier, R. Schaller and D. Cremers,
Efficient Online Surface Correction for Real-time Large-Scale 3D Reconstruction,
British Machine Vision Conference (BMVC), London, United Kingdom, September 2017.

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

2016
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[C1] V. Usenko, J. Engel, J. Stueckler and D. Cremers,
Direct Visual-Inertial Odometry with Stereo Cameras,
International Conference on Robotics and Automation (ICRA), May 2016.

[C2] L. Ma, C. Kerl, J. Stueckler and D. Cremers,
CPA-SLAM: Consistent Plane-Model Alignment for Direct RGB-D SLAM,
International Conference on Robotics and Automation (ICRA), May 2016.

[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
Journal Articles

[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,

Conference and Workshop Papers

[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*,
*IEEE International Conference on Computer Vision (ICCV)*, Santiago, Chile, 2015.

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*,

Conference and Workshop Papers

[C1] D. B. AD. 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*,

[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*,
*German Conference on Pattern Recognition (GCPR)*, Münster, Germany, September 2014, *Oral Presentation*.  

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[C7] O. Dunkley, J. Engel, J. Sturm and D. Cremers,  
Visual-Inertial Navigation for a Camera-Equipped 25g Nano-Quadrotor,  

[C8] D. Droeschel, J. Stueckler and S. Behnke,  
Local Multi-Resolution Surfel Grids for MAV Motion Estimation and 3D Mapping,  

[C9] J. Stueckler, A. Gutt and S. Behnke,  
Combining the Strengths of Sparse Interest Point and Dense Image Registration for RGB-D Odometry,  
Proc. of the Joint 45th International Symposium on Robotics (ISR) and 8th German Conference on Robotics (ROBOTIK), to appear, jun 2014.

[C10] D. Droeschel, J. Stueckler and S. Behnke,  
Local multi-resolution representation for 6D motion estimation and mapping with a continuously rotating 3D laser scanner,  
Proc. of the IEEE Int. Conf. on Robotics and Automation (ICRA), 5221-5226, may 2014.

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[M1] T Schöps,  
Semi-dense visual SLAM on mobile devices,  
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,  
Visual Inertial Control of a Nano-Quadrotor,  
Technical University Munich, Germany, Sept. 2014.

2013

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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,  
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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,
Demo Track of the RGB-D Workshop on Advanced Reasoning with Depth Cameras at the Robotics: Science and Systems Conference (RSS), June 2013.

[C4] C. Kerl, J. Sturm and D. Cremers,
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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Semi-Dense Visual Odometry for a Monocular Camera,
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[C7] F. Steinbruecker, C. Kerl, J. Sturm and D. Cremers,
Large-Scale Multi-Resolution Surface Reconstruction from RGB-D Sequences,
IEEE International Conference on Computer Vision (ICCV), Sydney, Australia, 2013.

[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,
Technische Universität München, Germany, September 2013.

2012
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[C1] F. Endres, J. Hess, N. Engelhard, J. Sturm, D. Cremers and W. Burgard,
An Evaluation of the RGB-D SLAM System,

[C2] J. Engel, J. Sturm and D. Cremers,
Camera-Based Navigation of a Low-Cost Quadrocopter,
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[C3] J. Sturm, N. Engelhard, F. Endres, W. Burgard and D. Cremers,
A Benchmark for the Evaluation of RGB-D SLAM Systems,

[C4] J. Engel, J. Sturm and D. Cremers,
Accurate Figure Flying with a Quadrocopter Using Onboard Visual and Iner-tial Sensing,

[C5] J. Sturm, W. Burgard and D. Cremers,
Evaluating Egomotion and Structure-from-Motion Approaches Using the TUM RGB-D Benchmark,

[C6] J. Stueckler and S. Behnke,
Integrating depth and color cues for dense multi-resolution scene mapping using RGB-D cameras,
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[C7] J. Stueckler and S. Behnke,
Robust Real-Time Registration of RGB-D Images using Multi-Resolution Sur-fel Representations,

MastersThesis

[M1] C. Kerl,
Odometry from RGB-D Cameras for Autonomous Quadrocopters,
Technical University Munich, Germany, Nov. 2012.

2011
Conference and Workshop Papers

[C1] N. Engelhard, F. Endres, J. Hess, J. Sturm and W. Burgard,
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Towards a benchmark for RGB-D SLAM evaluation,

[C3] F. Steinbruecker, J. Sturm and D. Cremers,
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Workshop on Live Dense Reconstruction with Moving Cameras at the Intl. Conf. on Computer Vision (ICCV), 2011.

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[M1] J. Engel,
*Autonomous Camera-Based Navigation of a Quadrocopter*,
Technical University Munich, Germany, Dec. 2011, Distinguished with the SIEMENS award for best Master’s Thesis 2012.

2010 Conference and Workshop Papers

[C1] J. Stühmer, S. Gumhold and D. Cremers,
*Real-Time Dense Geometry from a Handheld Camera*,
*Pattern Recognition (Proc. DAGM)*, Darmstadt, Germany, 11-20, September 2010.

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*Parallel Generalized Thresholding Scheme for Live Dense Geometry from a Handheld Camera*,
*ECCV Workshop on Computer Vision on GPUs (CVGPU)*, Heraklion, Greece, September 2010.

[C3] M. Nieuwenhuisen, J. Stueckler and S. Behnke,
*Improving indoor navigation of autonomous robots by an explicit representation of doors*,
*Proc. of the IEEE Int. Conf. on Robotics and Automation (ICRA)*, 4895-4901, May 2010.