2022

Journal Articles

[J1] S Leutenegger,
OKVIS2: Realtime Scalable Visual-Inertial SLAM with Loop Closure,

Conference and Workshop Papers

[C1] N Merrill, Y Guo, X Zuo, S Leutenegger, X Peng, L Ren and G Huang,
Symmetry and Uncertainty-Aware Object SLAM for 6DoF Object Pose Estimation,

[C2] D Henning, T Laidlow and S Leutenegger,
BodySLAM: Joint Camera Localisation, Mapping, and Human Motion Tracking,
_European Conference on Computer Vision (ECCV)_ 2022.

[C3] S Boche, X Zuo, S Schaefer and S Leutenegger,
Visual-Inertial SLAM with Tightly-Coupled Dropout-Tolerant GPS Fusion,

[C4] Y Ren, B Xu, CL. Choi and S Leutenegger,
Visual-Inertial Multi-Instance Dynamic SLAM with Object-Level Relocalisation,

[C5] B Xu, A Davison and S Leutenegger,
Learning to Complete Object Shapes for Object-level Mapping in Dynamic Scenes,

2021

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[J1] B Xu, AJ Davison and S Leutenegger,
Deep Probabilistic Feature-metric Tracking,

[J2] M Popovic, F Thomas, S Papatheodorou, N Funk, T Vidal-Calleja and S Leutenegger,
Volumetric Occupancy Mapping With Probabilistic Depth Completion for Robotic Navigation,

[J3] N Funk, J Tarrio, S Papatheodorou, M Popovic, PF. Alcantarilla and S Leutenegger,
Multi-Resolution 3D Mapping With Explicit Free Space Representation for Fast and Accurate Mobile Robot Motion Planning,

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1
[C1] Y Wang, N Funk, S Papatheodorou, M Popovic, M Camurri, S Leutenegger and M Fallon, 
Elastic and efficient lidar reconstruction for large-scale exploration tasks, 

2020
Conference and Workshop Papers

[C1] A Dai, S Papatheodorou, N Funk, D Tzoumanikas and S Leutenegger, 
Fast frontier-based information-driven autonomous exploration with an MAV, 

[C2] D Tzoumanikas, Q Yan and S Leutenegger, 
Nonlinear mpc with motor failure identification and recovery for safe and aggressive multicopter flight, 

[C3] U Bonde, PF Alcantarilla and S Leutenegger, 
Towards bounding-box free panoptic segmentation, 
German Conference on Pattern Recognition (GCPR), 2020.

[C4] Z Landgraf, F Falck, M Bloesch, S Leutenegger and AJ Davison, 
Comparing view-based and map-based semantic labelling in real-time SLAM, 

[C5] T Laidlow, J Czarnowski, A Nicastro, R Clark and S Leutenegger, 
Towards the Probabilistic Fusion of Learned Priors into Standard Pipelines for 3D Reconstruction, 

[C6] J Ortiz, M Pupilli, S Leutenegger and AJ Davison, 
Bundle adjustment on a graph processor, 

[C7] D Tzoumanikas, F Graule, Q Yan, D Shah, M Popovic and S Leutenegger, 
Aerial Manipulation Using Hybrid Force and Position NMPC Applied to Aerial Writing, 
2020.

2019
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[J1] D Tzoumanikas, W Li, M Grimm, K Zhang, M Kovac and S Leutenegger, 
Fully autonomous micro air vehicle flight and landing on a moving target using visual–inertial estimation and model-predictive control, 

[J2] K Zhang, P Chernprayong, D Tzoumanikas, W Li, M Grimm, M Smentoch, S Leutenegger and M Kovac, 
Bioinspired design of a landing system with soft shock absorbers for autonomous aerial robots, 
List of Publications

[J3] G Gallego, T Delbruck, G Orchard, C Bartolozzi, B Taba, A Censi, S Leutenegger, A Davison, J Conradt, K Daniilidis and others, 
Event-based vision: A survey, 

[J4] TK Kim, S Zafeiriou, B Glocker and S Leutenegger, 
Special Issue on Machine Vision, 

Conference and Workshop Papers

[C1] B Xu, W Li, D Tzoumanikas, M Bloesch, A Davison and S Leutenegger, 
Mid-fusion: Octree-based object-level multi-instance dynamic slam, 

[C2] A Nicastro, R Clark and S Leutenegger, 
X-section: Cross-section prediction for enhanced RGB-D fusion, 

[C3] S Zhi, M Bloesch, S Leutenegger and AJ Davison, 
Scenecode: Monocular dense semantic reconstruction using learned encoded scene representations, 

[C4] C Houseago, M Bloesch and S Leutenegger, 
KO-Fusion: dense visual SLAM with tightly-coupled kinematic and odometric tracking, 

[C5] T Laidlow, J Czarnowski and S Leutenegger, 
DeepFusion: real-time dense 3D reconstruction for monocular SLAM using single-view depth and gradient predictions, 

[C6] S Saeedi, ED Carvalho, W Li, D Tzoumanikas, S Leutenegger, PH Kelly and AJ Davison, 
Characterizing visual localization and mapping datasets, 

[C7] M Bloesch, T Laidlow, R Clark, S Leutenegger and AJ Davison, 
Learning meshes for dense visual SLAM, 

[C8] E Vespa, N Funk, PH Kelly and S Leutenegger, 
Adaptive-resolution octree-based volumetric SLAM, 
2018

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[J1] E Vespa, N Nikolov, M Grimm, L Nardi, PH Kelly and S Leutenegger,
Efficient octree-based volumetric SLAM supporting signed-distance and occupancy mapping,

Conference and Workshop Papers

[C1] M Bloesch, J Czarnowski, R Clark, S Leutenegger and AJ Davison,
CodeSLAM—learning a compact, optimisable representation for dense visual SLAM,
*Proceedings of the IEEE conference on computer vision and pattern recognition*, 2560-2568, 2018.

[C2] M Li, N Songur, P Orlov, S Leutenegger and AA Faisal,
Towards an Embodied Semantic Fovea: Semantic 3D scene reconstruction from ego-centric eye-tracker videos,
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[C3] W Li, S Saeedi, J McCormac, R Clark, D Tzoumanikas, Q Ye, Y Huang, R Tang and S Leutenegger,
InteriorNet: Mega-scale multi-sensor photo-realistic indoor scenes dataset,
2018.

[C4] J McCormac, R Clark, M Bloesch, A Davison and S Leutenegger,
Fusion++: Volumetric object-level slam,

[C5] R Clark, M Bloesch, J Czarnowski, S Leutenegger and AJ Davison,
Learning to solve nonlinear least squares for monocular stereo,

[C6] R Clark, M Bloesch, J Czarnowski, S Leutenegger and AJ Davison,
Ls-net: Learning to solve nonlinear least squares for monocular stereo,
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2017

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[J1] P Oettershagen, A Melzer, T Mantel, K Rudin, T Stastny, B Wawrzacz, T Hinzmann, S Leutenegger, K Alexis and R Siegwart,
Design of small hand-launched solar-powered UAVs: From concept study to a multi-day world endurance record flight,

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[C1] J McCormac, A Handa, A Davison and S Leutenegger,
Semanticfusion: Dense 3d semantic mapping with convolutional neural networks,
[C2] R Lukierski, S Leutenegger and AJ Davison, 
*Room layout estimation from rapid omnidirectional exploration*, 

[C3] L Platinsky, AJ Davison and S Leutenegger, 
*Monocular visual odometry: Sparse joint optimisation or dense alternation?*, 

[C4] J Czarnowski, S Leutenegger and AJ Davison, 
*Semantic texture for robust dense tracking*, 

[C5] T Laidlow, M Bloesch, W Li and S Leutenegger, 
*Dense rgb-d-inertial slam with map deformations*, 

[C6] J McCormac, A Handa, S Leutenegger and AJ Davison, 
*Scenenet rgb-d: Can 5m synthetic images beat generic imagenet pre-training on indoor segmentation?*, 

[C7] R Clark, J McCormac, S Leutenegger and A Davison, 
*Meta-learning for instance-level data association*, 

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[J1] M Bloesch, H Sommer, T Laidlow, M Burri, G Nuetzi, P Fankhauser, D Bellicoso, C Gehring, S Leutenegger, M Hutter and others, 
*A primer on the differential calculus of 3d orientations*, 

[J2] T Whelan, RF Salas-Moreno, B Glocker, AJ Davison and S Leutenegger, 
*ElasticFusion: Real-time dense SLAM and light source estimation*, 

**Book Chapters**

[BC1] S Leutenegger, C Hürzeler, AK Stowers, K Alexis, MW Achtelik, D Lentink, PY Oh and R Siegwart, 
*Flying robots*, 

**Conference and Workshop Papers**

[C1] E Johns, S Leutenegger and AJ Davison, 
*Pairwise decomposition of image sequences for active multi-view recognition*, 
[C2] P Bardow, AJ Davison and S Leutenegger,
Simultaneous optical flow and intensity estimation from an event camera,

[C3] E Johns, S Leutenegger and AJ Davison,
Deep learning a grasp function for grasping under gripper pose uncertainty,

[C4] J Zienkiewicz, A Davison and S Leutenegger,
Real-time height map fusion using differentiable rendering,

[C5] H Kim, S Leutenegger and AJ Davison,
Real-time 3D reconstruction and 6-DoF tracking with an event camera,

[C6] J Zienkiewicz, A Tsiotsios, A Davison and S Leutenegger,
Monocular, real-time surface reconstruction using dynamic level of detail,

2015

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[J1] S Leutenegger, S Lynen, M Bosse, R Siegwart and P Furgale,
Keyframe-based visual–inertial odometry using nonlinear optimization,

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[C1] M Milford, H Kim, M Mangan, S Leutenegger, T Stone, B Webb and A Davison,
Place recognition with event-based cameras and a neural implementation of SeqSLAM,

[C2] P Oettershagen, A Melzer, T Mantel, K Rudin, R Lotz, D Siebenmann, S Leutenegger, K Alexis and R Siegwart,
A solar-powered hand-launchable UAV for low-altitude multi-day continuous flight,

[C3] M Milford, H Kim, S Leutenegger and A Davison,
Towards visual slam with event-based cameras,
The problem of mobile sensors workshop in conjunction with RSS, 2015.

[C4] R Lukierski, S Leutenegger and AJ Davison,
Rapid free-space mapping from a single omnidirectional camera,
[C5] T Whelan, S Leutenegger, RF. Salas-Moreno, B Glocker and AJ Davison,  
ElasticFusion: Dense SLAM Without A Pose Graph,  

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[C1] J Nikolic, J Rehder, M Burri, P Gohl, S Leutenegger, PT Furgale and R Siegwart,  
A synchronized visual-inertial sensor system with FPGA pre-processing for accurate real-time SLAM,  
[C2] P Oettershagen, A Melzer, S Leutenegger, K Alexis and R Siegwart,  
Explicit model predictive control and l 1-navigation strategies for fixed-wing uav path tracking,  
22nd Mediterranean Conference on Control and Automation, 1159-1165, 2014.  
[C3] S Leutenegger, A Melzer, K Alexis and R Siegwart,  
Robust state estimation for small unmanned airplanes,  
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[PhD1] S Leutenegger,  
Unmanned solar airplanes: Design and algorithms for efficient and robust autonomous operation,  
ETH Zurich, 2014.

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[J1] M Bloesch, M Hutter, MA Hoepflinger, S Leutenegger, C Gehring, CD Remy and R Siegwart,  
State estimation for legged robots-consistent fusion of leg kinematics and IMU,  

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[C1] J Nikolic, M Burri, J Rehder, S Leutenegger, C Huerzeler and R Siegwart,  
A UAV system for inspection of industrial facilities,  
Design and control of a spherical omnidirectional blimp,  
[C3] L Marconi, S Leutenegger, S Lynen, M Burri, R Naldi and C Melchiorri,  
Ground and aerial robots as an aid to alpine search and rescue: Initial sherpa outcomes,  
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[C1] L Marconi, C Melchiorri, M Beetz, D Pangeric, R Siegwart, S Leutenegger, R Carloni, S Stramigioli, H Bruyninckx, P Doherty and others,
The SHERPA project: Smart collaboration between humans and ground-aerial robots for improving rescuing activities in alpine environments,

[C2] S Leutenegger and RY Siegwart,
A low-cost and fail-safe inertial navigation system for airplanes,

2011

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[J1] S Leutenegger, M Jabas and RY Siegwart,
Solar airplane conceptual design and performance estimation,

Conference and Workshop Papers

[C1] S Leutenegger, M Chli and RY Siegwart,
BRISK: Binary robust invariant scalable keypoints,
2011 International conference on computer vision, 2548-2555, 2011.

[C2] P Fankhauser, S Bouabdallah, S Leutenegger and R Siegwart,
Modeling and decoupling control of the coax micro helicopter,

2010

MastersThesis

[M1] P Fankhauser and C Gwerder,
Modeling and control of a ballbot,
Eidgenössische Technische Hochschule Zürich, 2010.

2009

Journal Articles

[J1] A Noth,
Designing solar airplanes for continuous flight,
2008
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[C1] C Bermes, S Leutenegger, S Bouabdallah, D Schafroth and R Siegwart,
New design of the steering mechanism for a mini coaxial helicopter,

[C2] C Bermes, S Leutenegger, S Bouabdallah and R Siegwart,
Design and Comparison of a Steering Mechanism for an Autonomous Coaxial Indoor Helicopter,

2007
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[J1] S Leutenegger, C Bermes and S Bouabdallah,
Mechanical design and realization of a steering mechanism for a coaxial helicopter,

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[C1] DJ Bell, S Leutenegger, K Hammar, L Dong and BJ Nelson,