2023

Conference and Workshop Papers

[C1] S Papatheodorou, N Funk, D Tzoumanikas, C Choi, B Xu and S Leutenegger,
Finding Things in the Unknown: Semantic Object-Centric Exploration with an MAV,

2022

Journal Articles

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

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[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,
All: 1  

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[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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[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

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[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,  
Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition,  

[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 Chemprayong, 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,*

[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,*

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

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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,

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[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,

[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,
2018.

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?,

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Semantic texture for robust dense tracking,

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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,
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[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 Leutenberg,
Monocular, real-time surface reconstruction using dynamic level of detail, 

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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.
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[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 L1-navigation strategies for fixed-wing uav path tracking,  

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Robust state estimation for small unmanned airplanes,  
*2014 IEEE Conference on Control Applications (CCA)*, 1003-1010, 2014.

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[PhD1] S Leutenegger,  
Unmanned solar airplanes: Design and algorithms for efficient and robust autonomous operation,  
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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,  
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[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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[J1] S Leutenegger and others,
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[C1] L Marconi, C Melchiorri, M Beetz, D Pangercic, 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,

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

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[C1] S Leutenegger, M Chli and RY Siegwart,
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2011 International conference on computer vision, 2548-2555, 2011.

[C2] P Fankhauser, S Bouabdallah, S Leutenegger and R Siegwart,
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[M1] P Fankhauser and C Gwerder,
Modeling and control of a ballbot,
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[J1] A Noth,
Designing solar airplanes for continuous flight,

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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,
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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,