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List of Publications

2021

2020

Journal Articles

[J1] U Bonde, PF Alcantarilla and S Leutenegger,
Towards bounding-box free panoptic segmentation,

[J2] 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,

[J3] S Leutenegger,
OKVIS 2.0 for the FPV Drone Racing VIO Competition 2020,
2020.

[J4] B Xu, AJ Davison and S Leutenegger,
Deep Probabilistic Feature-metric Tracking,

[J5] 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,

[J6] Y Wang, N Funk, M Ramezani, S Papatheodorou, M Popovic, M Camurri, S Leutenegger and M Fallon,
Elastic and Efficient LiDAR Reconstruction for Large-Scale Exploration Tasks,

[J7] M Popovic, F Thomas, S Papatheodorou, N Funk, T Vidal-Calleja and S Leutenegger,
Efficient Volumetric Mapping Using Depth Completion With Uncertainty for Robotic Navigation,

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] Z Landgraf, F Falck, M Bloesch, S Leutenegger and AJ Davison,
Comparing view-based and map-based semantic labelling in real-time SLAM,
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[C4] T Laidlow, J Czarnowski, A Nicastro, R Clark and S Leutenegger,
Towards the Probabilistic Fusion of Learned Priors into Standard Pipelines for 3D Reconstruction,

[C5] 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*,

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 Chermprayong, 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,

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

[C4] C Houseago, M Bloesch and S Leutenegger,
KO-Fusion: dense visual SLAM with tightly-coupled kinematic and odometric tracking,
T Laidlow, J Czarnowski and S Leutenegger,  
**DeepFusion: real-time dense 3D reconstruction for monocular SLAM using single-view depth and gradient predictions**,  

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

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

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

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

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**,  

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**,  

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

E Vespa, N Nikolov, M Grimm, L Nardi, PH Kelly and S Leutenegger,  
**CodeSLAM—learning a compact, optimisable representation for dense visual SLAM**,  
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J McCormac, R Clark, M Bloesch, A Davison and S Leutenegger,  
**Fusion++: Volumetric object-level slam**,  

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

2016

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[J1] M Bloesch, H Sommer, T Laidlow, M Burri, G Nuetzi, P Funkhauser, D Bellicoso, C Gehring, S Leutenegger, M Hutter and others, 
A primer on the differential calculus of 3d orientations, 
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[J2] T Whelan, RF Salas-Moreno, B Glocker, AJ Davison and S Leutenegger,
ElasticFusion: Real-time dense SLAM and light source estimation,

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[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 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,

[J2] 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,

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[C1] 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,

[C2] 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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Rapid free-space mapping from a single omnidirectional camera,

[C4] T Whelan, S Leutenegger, RF. Salas-Moreno, B Glocker and AJ. Davison,
ElasticFusion: Dense SLAM Without A Pose Graph,

2014
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[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,
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[C3] S Leutenegger, A Melzer, K Alexis and R Siegwart,
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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2013
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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,

Conference and Workshop Papers
[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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[J1] S Leutenegger and others,
Image Keypoint Detection, Description, and Matching,

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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,

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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,
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,
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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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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,
Flagella-like propulsion for microrobots using a nanocoil and a rotating electromagnetic field,