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,
[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,

2019
Journal Articles

[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,

[C4] C Houseago, M Bloesch and S Leutenegger,
KO-Fusion: dense visual SLAM with tightly-coupled kinematic and odometric tracking,
All: 1

List of Publications

[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

Journal Articles

[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,

[J2] 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,

[J3] 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,

[J4] R Clark, M Bloesch, J Czarnowski, S Leutenegger and AJ Davison,
Ls-net: Learning to solve nonlinear least squares for monocular stereo,

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

[C3] R Clark, M Bloesch, J Czarnowski, S Leutenegger and AJ Davison,
Learning to solve nonlinear least squares for monocular stereo,
# List of Publications

## 2017

### Journal Articles

- **[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*,
  

### Conference and Workshop Papers

- **[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*,
  

## 2016

### Journal Articles

- **[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*,
  
All: 1

List of Publications

[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,
Intelligent Robots and Systems (IROS), 2016 IEEE/RSJ International Conference on,
4461-4468, 2016.

[C4] J Zienkiewicz, A Davison and S Leutenegger,
Real-time height map fusion using differentiable rendering,
2016 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS),
4280-4287, 2016.

[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

Journal Articles

[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,

Conference and Workshop Papers


2014
Conference and Workshop Papers


PhDThesis

[PhD1] S Leutenegger, Unmanned solar airplanes: Design and algorithms for efficient and robust autonomous operation, ETH Zurich, 2014.

2013
Journal Articles


Conference and Workshop Papers
All: 1

List of Publications

[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,

2012

Journal Articles

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

Conference and Workshop Papers

[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

Journal Articles

[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
Conference and Workshop Papers

[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
Journal Articles

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

Conference and Workshop Papers

[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*,