Simultaneous Localization and Mapping (SLAM) Baseline

Assylbek Dakibay

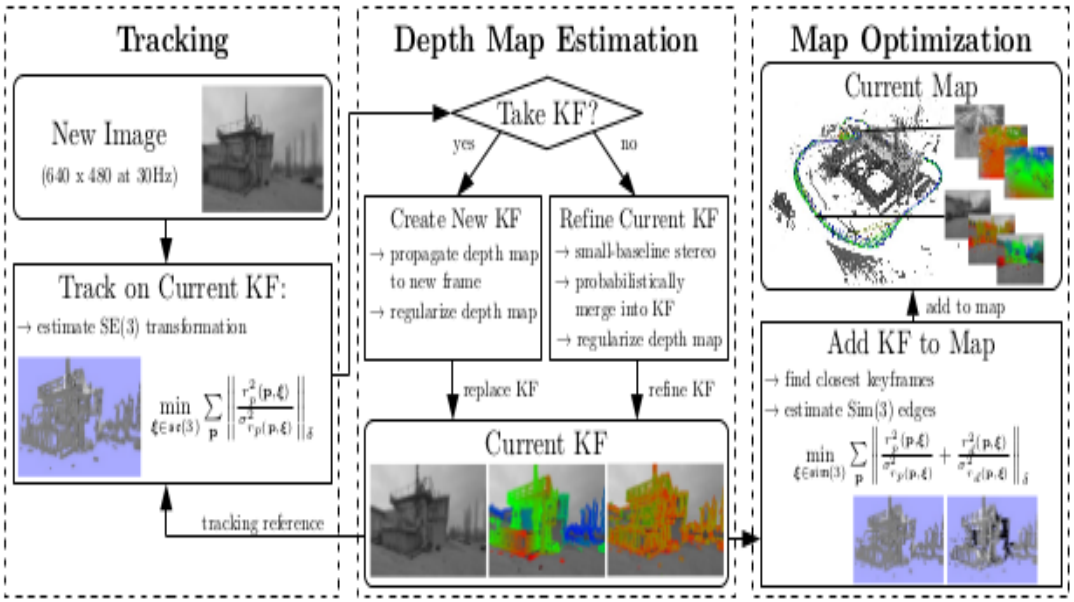
University of Waterloo

dakibay@gmail.com

May 25, 2017

Overview

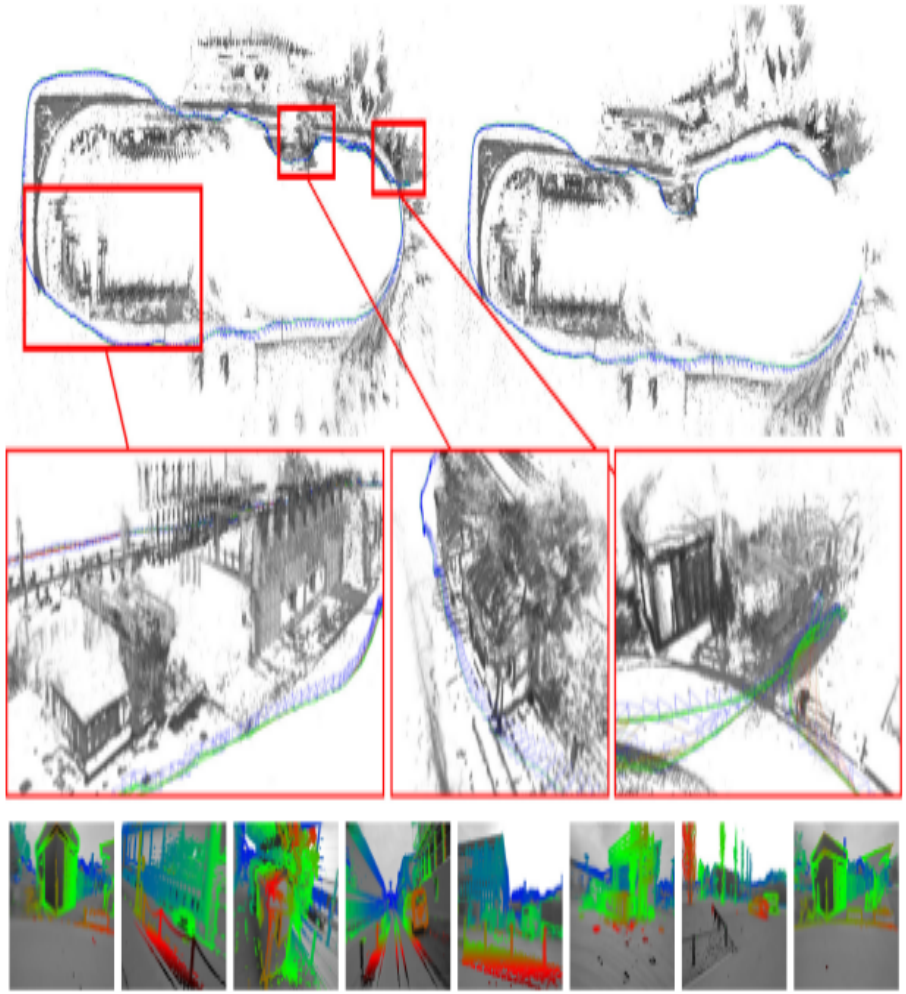
Large Scale Direct SLAM



Large Scale Direct (LSD) Monocular SLAM Process Featureless SLAM algorithm that can be run in real time on a CPU [1].

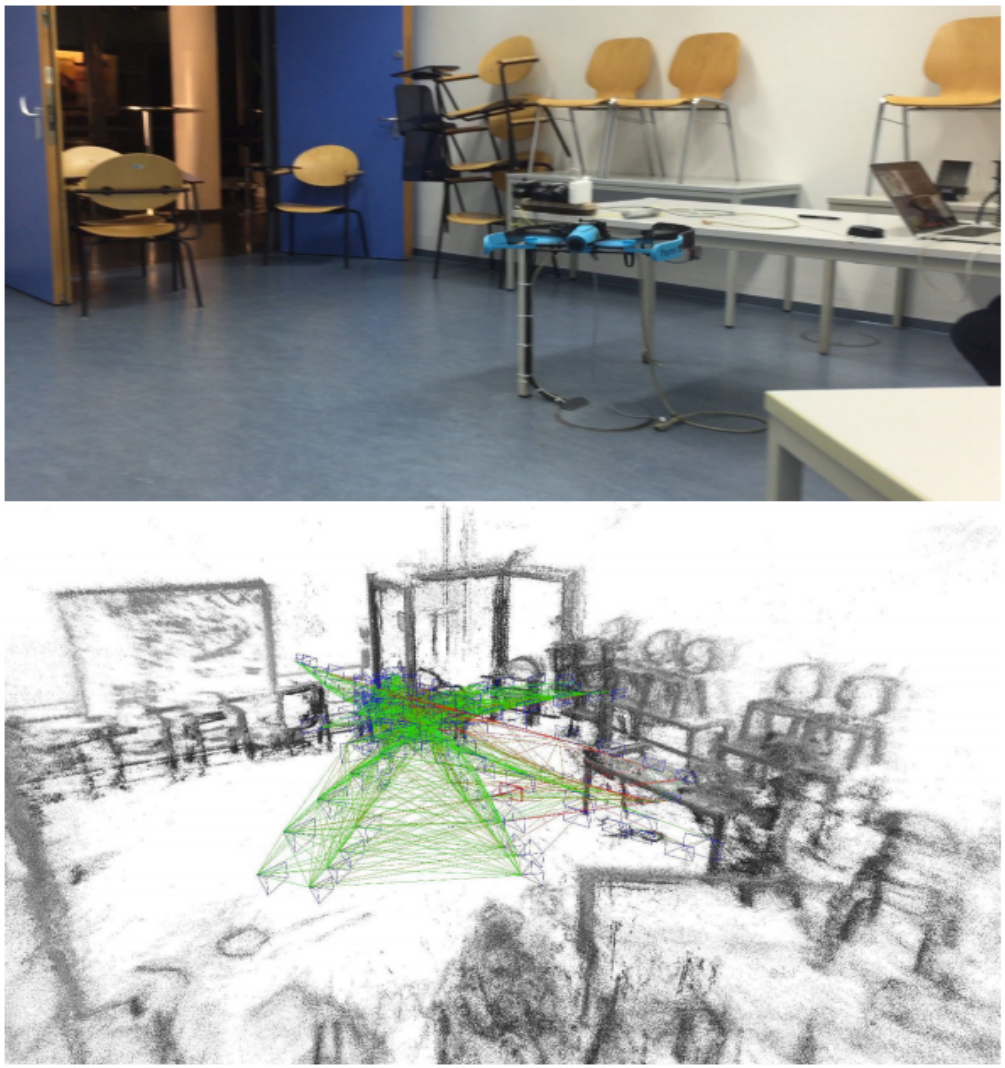
SVO

Loop Closure Generated maps for outdoors environment before and after loop closure [1].



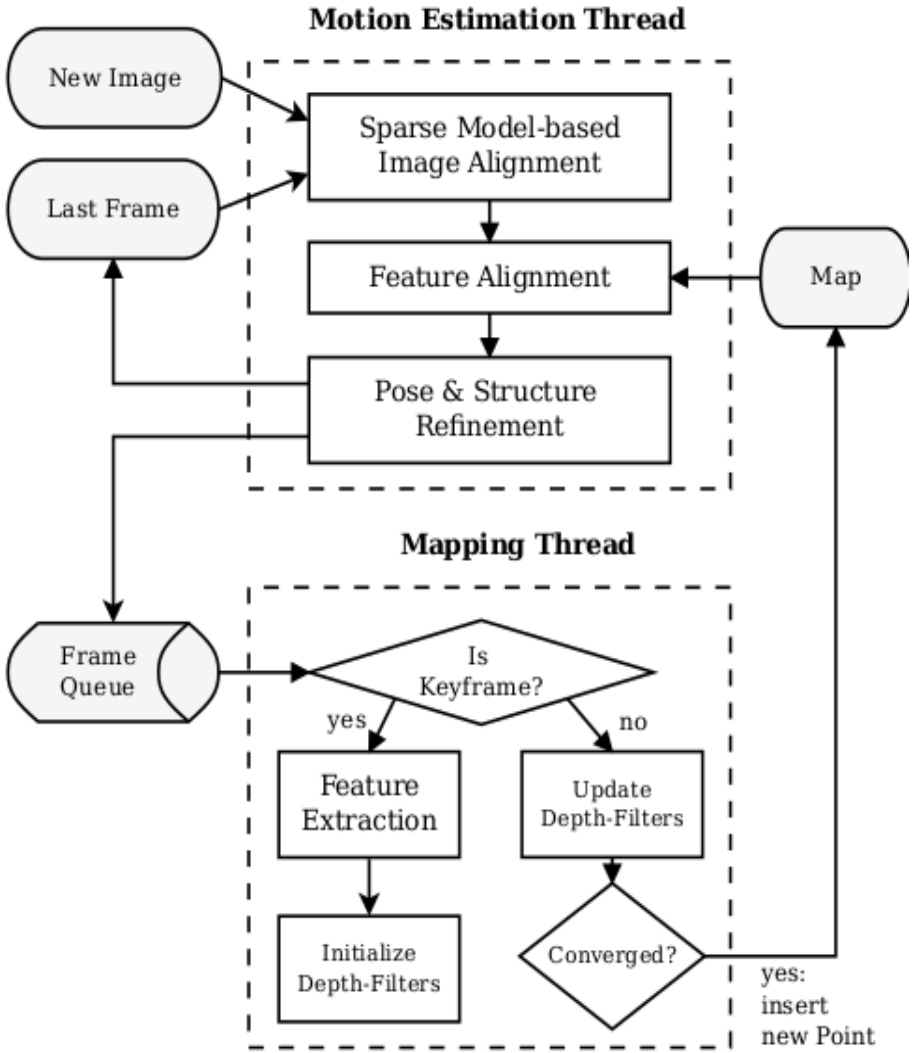
LSD SLAM On MAV

LSD SLAM using MAV Micro Aerial Vehicle (Parrot Bebop). Ultrasonic and air pressure sensors are used for improving scale measurements [2].



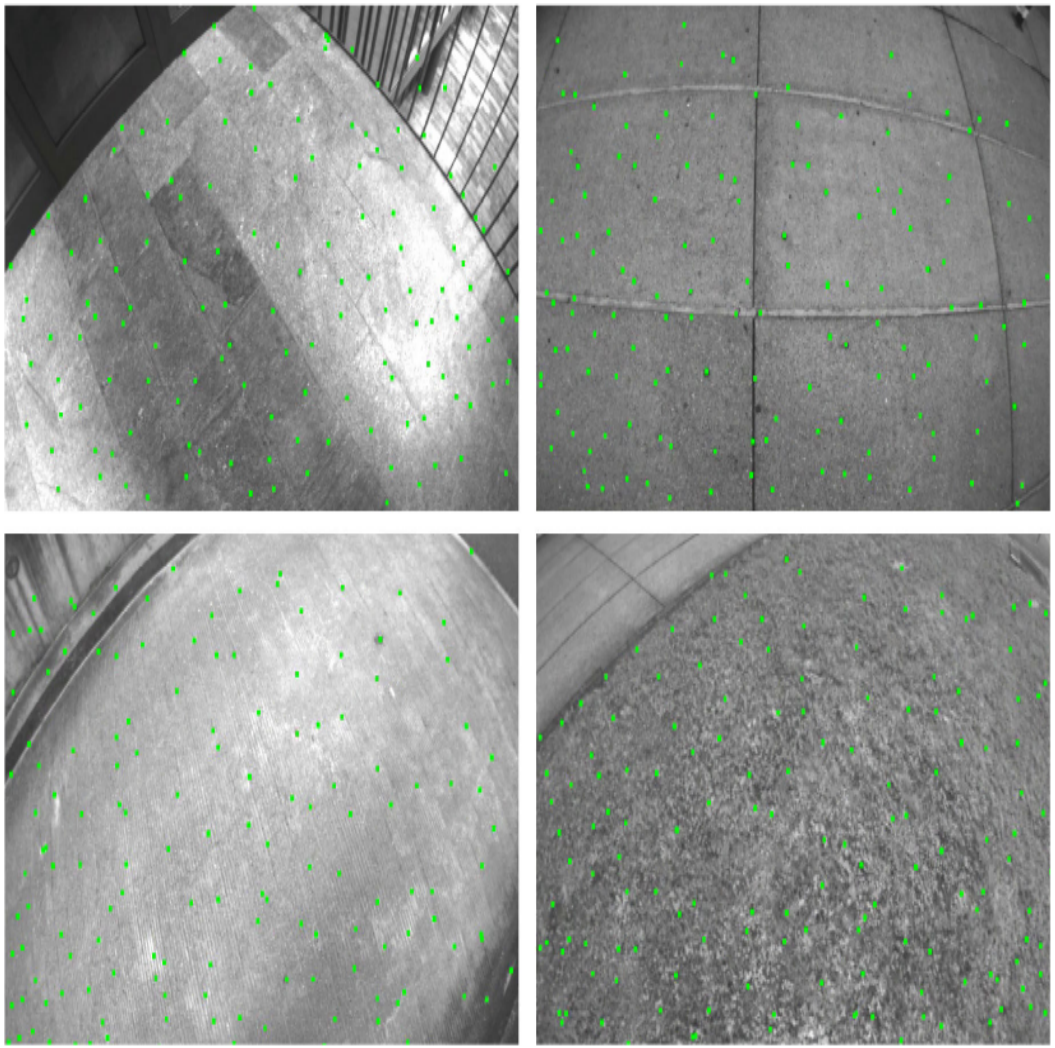
SVO

Fast Semi-Direct Visual Odometry (SVO) The SVO process [3].



Multiple Columns

Fast Semi-Direct Visual Odometry (SVO) Results The SVO Mapping results for outdoors environment using a Micro Aerial Vehicle [3].




J. Engel, T. Schöps, and D. Cremers, "Lsd-slam: Large-scale direct monocular slam," in *European Conference on Computer Vision*. Springer, 2014, pp. 834–849.


L. von Stumberg, V. Usenko, J. Engel, J. Stückler, and D. Cremers, "Autonomous exploration with a low-cost quadrocopter using semi-dense monocular slam," *arXiv preprint arXiv:1609.07835*, 2016.


C. Forster, M. Pizzoli, and D. Scaramuzza, "Svo: Fast semi-direct monocular visual odometry," in *Robotics and Automation (ICRA), 2014 IEEE International Conference on*. IEEE, 2014, pp. 15–22.