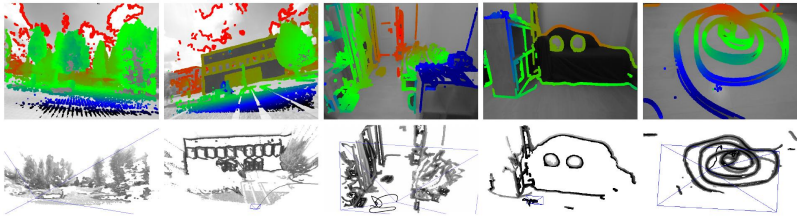


Semi-Dense Visual Odometry for a Monocular Camera

J. Engel, J. Sturm and D. Cremers (ICCV 2013)



- ▶ Real-time visual odometry method for a monocular camera
- ▶ Continuously estimate a semi-dense inverse depth map which is used to track the motion of the camera
- ▶ Depth estimation for pixel with non-negligible gradients using multi-view stereo
- ▶ Each estimate is represented as a Gaussian probability distribution over the inverse depth (corresponds to update step of Kalman filter)
- ▶ Reference frame is selected such that the observation angle is small
- ▶ Propagate depth maps from frame to frame (corresponding to prediction step of Kalman filter) and refine with new stereo depth measurements
- ▶ Whole image alignment using depth estimates for tracking
- ▶ Comparable tracking performance with fully dense methods without requiring a depth sensor