

Detailed Real-Time Urban 3D Reconstruction From Video

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- ▶ Large scale, real-time 3D reconstruction incorporating GPS and INS or traditional SfM
- ▶ Motivation:
 - ▶ The massive amounts of data
 - ▶ Lack of public high-quality ground-based models
- ▶ Real-time performance (30Hz) using graphics hardware and standard CPUs
- ▶ Extending state-of-the-art for robustness and variability necessary for outside:
 - ▶ Large dynamic range: automatic gain adaptation for real-time stereo estimation
- ▶ Fusion with GPS and inertial measurements using a Kalman filter
- ▶ Two-step stereo reconstruction process exploiting the redundancy across frames
- ▶ Real urban video sequences with hundreds of thousands of frames on GPU