PHOTOMETRIC BASED 3D REGISTRATION

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**Problem**
Computation of homologous points from corresponding images is one of the most studied problems in computer vision and photogrammetry. Due to the geometric transformation, the number of point matches is decreased when the angles between the images are increased.

**Short baseline**

**Wide baseline**

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**General Strategy**

1. Compute images that are locally ortho-rectified, and memorize the mapping from initial into ortho-rectified image.
2. Obtain point matches on the ortho-rectified.
3. Import the point matches into the initial geometry, using the inverse mapping.

**Smooth Surface Scene**

Images (view 1 and view 2)

Conformal images

SIFT matching on conformal images

Comparison # of point matches between SIFT and our approach

- vertices = 3,427
- faces = 6,572

- vertices = 3,393
- faces = 6,605

**Future Works**

- Perform automatically segmentation of 3D point clouds between plane region, smooth region and “noisy” region (e.g. trees), this is necessary to obtain an automatic system.
- Use more sophisticated development than least square conformal mapping, for example non linear isometric constraint to limit possible degeneracy with unsmooth surface.

**References**