Outline
CS376 Computer Vision
Monday, March 28, 2011

Stereo : Correspondence and calibration

Recap: epipolar constraint, essential matrix example

Stereo image rectification

Stereo solutions

- Search for dense or sparse correspondences
- Effect of window size
- Classic pitfalls
- Non-geometric stereo constraints: uniqueness, ordering, disparity gradient
- Computing disparity solution: shortest paths per scanline; energy minimization (main idea)

Calibration

- With calibration object
    - Solve for projection matrix to relate scene points to image points
- Weak calibration
    - Solve for fundamental matrix to relate image points to image points between views
    - Use of RANSAC

Example applications and demos

- Audio camera as “cross-modal” epipolar geometry
- Edges in depth maps for segmentation
- Human body tracking by fitting cylinders
- Virtual viewpoint interpolation
- Kinect body tracking