Discussion of 3D Plane-Based Recognition

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Range data: edges

Edges originate in range data from:
- Changes in depth: **blade edge**
- Changes in surface orientation: **fold edge**
- Changes in surface curvature properties

Blade and fold edges also usable for recognition
Similar to 2D case or 3D Stereo
But less reliable to extract than surfaces

Discussion

- Range sensors now commercially available: we designed a £50 sensor, quality commercial from £1000, Kinect from £100
- Accuracy can be amazing: our commercial sensor has 10 μm accuracy; Kinect: 0.5-5 cm
- Range data unambiguous and very useful: gives 3D info directly rather than needing inference from other data

- Many different ways to segment data patches, many sensitive to data noise and slow.
- Much more efficient to segment if data is in image array rather than a set of points
- Techniques presented here particularly useful in an industrial or robot navigation context

What We Have Learned

- Range image and 3D point cloud data
- Triangulation range sensor technology
- Least square planar surface fitting
- Region growing
- 3D coordinate systems and transformation specification
- 3D wire frame shape modelling
- 3D pose estimation