Discussion of 3D Plane-Based Recognition

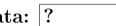Robert B. Fisher

School of Informatics

University of Edinburgh

Range data: ?

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 ? 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 ? rather than a set of points

- Techniques presented here particularly useful in an industrial or robot navigation context

What We Have Learned

- ⟦ ? ⟧ 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