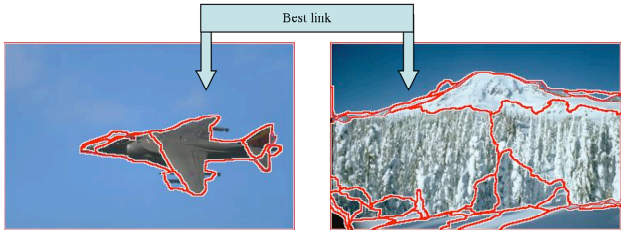
Images for a quick review of texture.

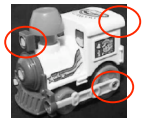


From Lowe, IJCV 2004

Can you find the locomotive? Can a computer program?

Invariant feature detection

- Consider representing an image of an object as a collection of descriptive local features
  - Distinct
    - Good chance that match is correct
  - Invariant to scale and rotation
    - Match even if rotated
    - Match even if bigger or smaller
    - Match even brighter or darker



- Canonical example is David Lowe's SIFT (Scale Invariant Feature Transform) method.*

*Good reference is Lowe, IJCV, 2004

Invariant feature detection*

- Consider representing an image of an object with a collection of descriptive local features
- Most useful if these occur in "edgy" areas.
- Common modern strategy is do detect somewhat robust "interest points" and form a descriptor for the local area.
- Example descriptor is a histogram of edge orientations (local texture).

*Good reference is Lowe, IJCV, 2004

Distinctive Key-Points

- Edges are interesting, but are they really distinctive?
  - Not for many applications because they do not have good localization
  - More distinctive is a corner or a grid point
- Various strategies exist for finding "key-points" that are distinctive and localizable
- One idea is to look for edgy areas where one edge direction does NOT overly dominate the other
  - EG, a corner has both horizontal and vertical responses

The rest of material covered in lecture 17 was done in more detail in lecture 18. See those slides for continuation of SIFT.