Classification objects

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Introduction

Classification image technique allows us to see observer's template.

If observers have a 3D representation of objects, "classification object" will show it.

Some (e.g. Marr, Biederman) say humans have true 3D representation.

Others (e.g. Bülthoff, Tarr) say we have "view-dependent" representation.

Method

Classification object technique is like classification image except noise is added to the z-coordinate at each point.

Observers viewed either a sinewave surface or a 3D face.

Random dots sat on the surface; depth conveyed by y-rotation (kinetic depth effect).

Detection task: sinewave vs flat or face vs flat. Staircase varied depth contrast to be near threshold (p(c)=0.71)

10,000 trials

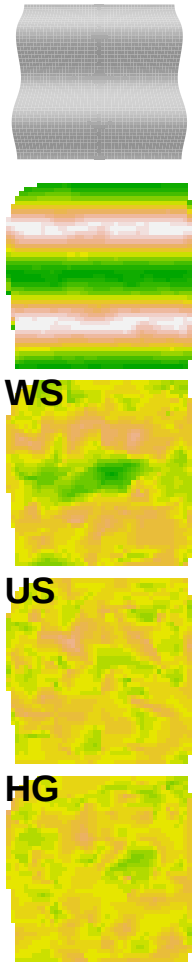

Figure 1. Top two panels, sinewave surface which was displayed as y-rotating random dots. Next panels show classification objects.

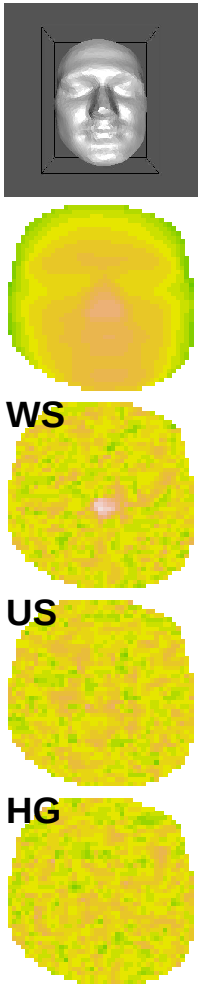

Figure 2. Top two panels, 3D face which was displayed as y-rotating random dots. Next panels show classification objects.

Results

Classification object for sinewave surface highly resembles the 3D stimulus; $r = 0.51, 0.22, 0.14$ for the three observers)

Classification object for face picks up only the tip of the nose.

Conclusions

- Humans have a true 3D representation of simple shapes
- Humans do *not* have a true 3D representation of faces
- This result is consistent with literature showing that recognition of faces is viewpoint dependent

Contact

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