On Symmetry, Illusory Contours and Visual Perception

*Introduction to Computational and Biological Vision 2007*
Symmetry
“invariance under a specified group of transformations”

- Widely present in nature
- Most animals have bilateral symmetry
- Its detection seems to be fundamental to survival
- Its detection is pre-attentive
Illusory Contours

Modal shape completion occurs when the borders are perceived, despite of being inexistent in the visual stimulus, as being above the stimulus by a brightness enhancement of the completed shape.
Visual Illusions
Neglect is a neurological condition under which patients with unilateral (often right) parietal lesion fail to consciously perceive stimulus shown in the contra-lateral (left) visual field.” - Driver & Mattingley, 1998.
Symptoms

- fail to detect objects on the contralateral side (opposite) to their injury
- fail to notice or hear people standing in their left side
- eat just what is in the right side of his plate
- shave just the right side of his face
- hold his head slightly inclined to the right
- claim that his left limbs are somebody else’s
- read just the second part of a word
Diagnosis
Experiment One:
What do you see?
Experiment Two: Line Bisection

- Vuilleumier and Landis, 1997
- Driver, Baylis and Rafal 1992
Experiment Three: The “Symmetry-Completion” effect

Neglect patients tend to copy/draw just half of a symmetrical object, although they don’t report “seeing” just one half of it. Is it an indication that this “symmetrical completion” takes place?
Conclusions/Future Research

- Do Neglect patients perceive the illusions?
- A new diagnosis tool

- Is Contour Completion really pre-attentive?
- Better understanding of perceptive processes

- Symmetry detection x contour completion