

## Mind and Computer Vision

May 30, 2007  
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## Tracking multiple targets

### Count basketball passes

<http://viscog.beckman.uiuc.edu/grafs/demos/15.html>

- A. 16
- B. 21
- C. 23
- D. 26
- E. None of the above



## Tracking color changes

### Color of cards

<http://www.youtube.com/watch?v=voAntzB7EwE>

## Tracking content changes

- ▶ Example 1
- ▶ Example 2
- ▶ Example 3

*Ron Rensink, CS+Psych @ UBC*

<http://www.cs.ubc.ca/~rensink/flicker/index.html>

## Vision Research

*understand* how we see: represent and process information carried by light

- measuring and modeling visual performance in humans and other animals
- characterizing neural mechanisms that implement visual systems
  - ▶ *hypothesize* possible subtasks performed by specialized regions of the brain
  - ▶ *test* hypotheses using psychophysical experiments
- finding ways to build artificial visual systems

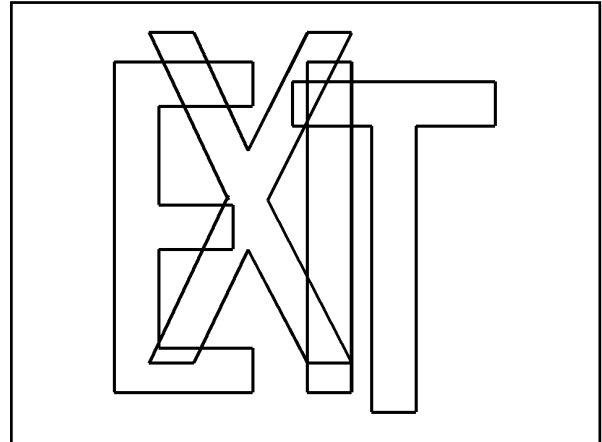
## Vision Research

*apply* understanding and insights

- in new software, e.g.:
  - ▶ present information in a way that takes users' ways of processing images into account
  - ▶ develop smart image processing systems, e.g., autostitching panoramas
- to obtain medical, technological advances

## processing of images in humans

- ▶ rods and cones (sensory cells in the retina) represent image as large 2D array of light intensities
  - about 126 million sensory cells!
- ▶ this image is processed by brain, enabling complex cognitive functions
  - recognize a familiar face or scene
  - disambiguate overlapping objects
  - read sloppy handwriting
- ▶ how does the brain do all of this? how might image processing be partitioned into subtasks?



## image processing tasks

- ▶ possible tasks:
  - extraction of contour (e.g. sharp light intensity changes in the image)
  - extraction of motion
  - identification of object parts
- ▶ still unclear: how are these integrated to enable us to extract meaning from what we see?

## Acknowledgements

- ▶ Dinesh K. Pai
- ▶ Hendrik Kueck