9.35 Sensation And Perception
Spring 2009

Motion

4/7/08

A few motion issues

- Motion is time dependent – processing takes time.
- dx/dt – what is X?
- Recognition from motion.

Dealing with delays.

- Prediction.
  - Retina
  - Flash Lag
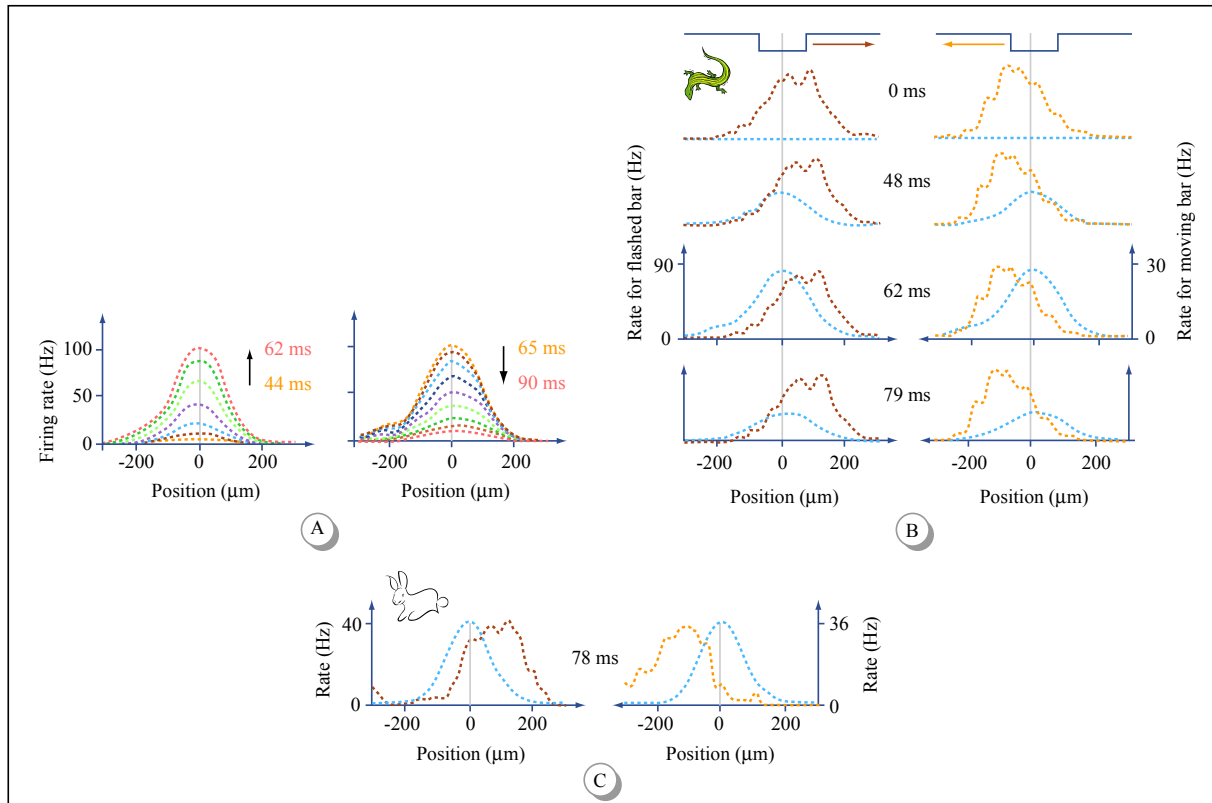- Postdiction (making yourself consistent).

Prediction in the retina.

Figure by MIT OpenCourseWare.

Anticipation of moving stimuli by the retina

Michael J. Berry II, Iman H. Brivanlou, Thomas A. Jordan*
& Markus Meister

Decoding from retinal motion signal

Figures removed due to copyright restriction.

Flash Lag

- http://www.michaelbach.de/ot/mot_flashlag1/flashlag-fillin-2.swf

Post-diction

**Motion Integration and
Postdiction in Visual Awareness**

David M. Eagleman[1,2,4*] and Terrence J. Sejnowski[2,3,4]

Figures removed due to copyright restriction.

dx/dt. What is x?

- Stuff in the world moves.

- We move (eyes, head, body).

- We measure the projections of (possibly) moving stuff onto our moving sensory organs.
  - Retina
  - Apertures and knowledge.

Motion on the retina

Figure removed due to copyright restriction.

Accounting for eye-motion

Q. When do we see an object move?
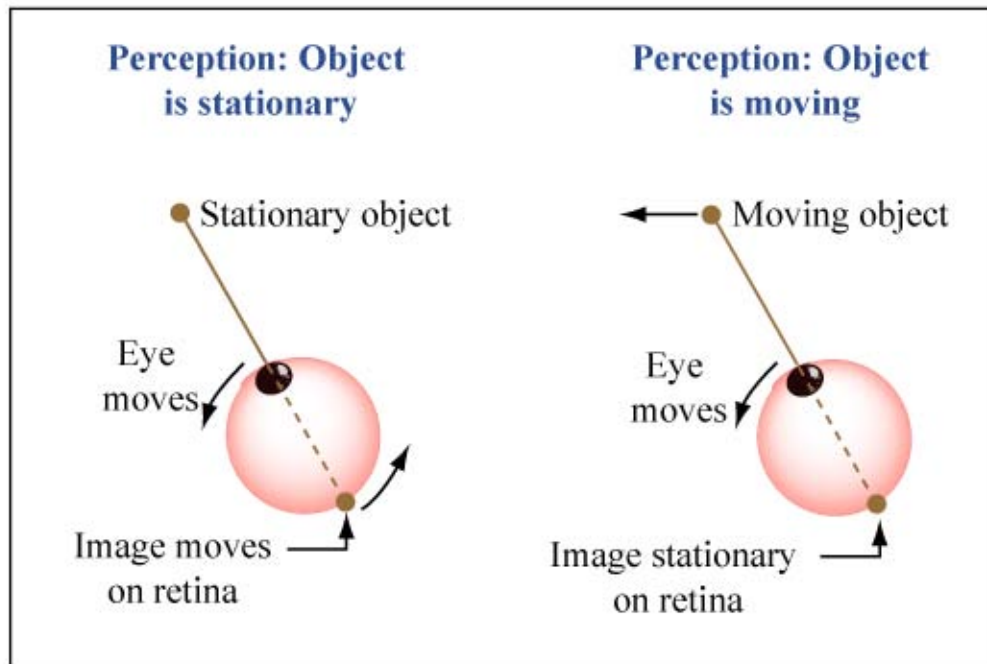A. When its image moves on the retina.
    Is this really true?

Perception: Object is stationary — Stationary object, Eye moves, Image moves on retina.
Perception: Object is moving — Moving object, Eye moves, Image stationary on retina.

Accounting for eye-motion (contd.)

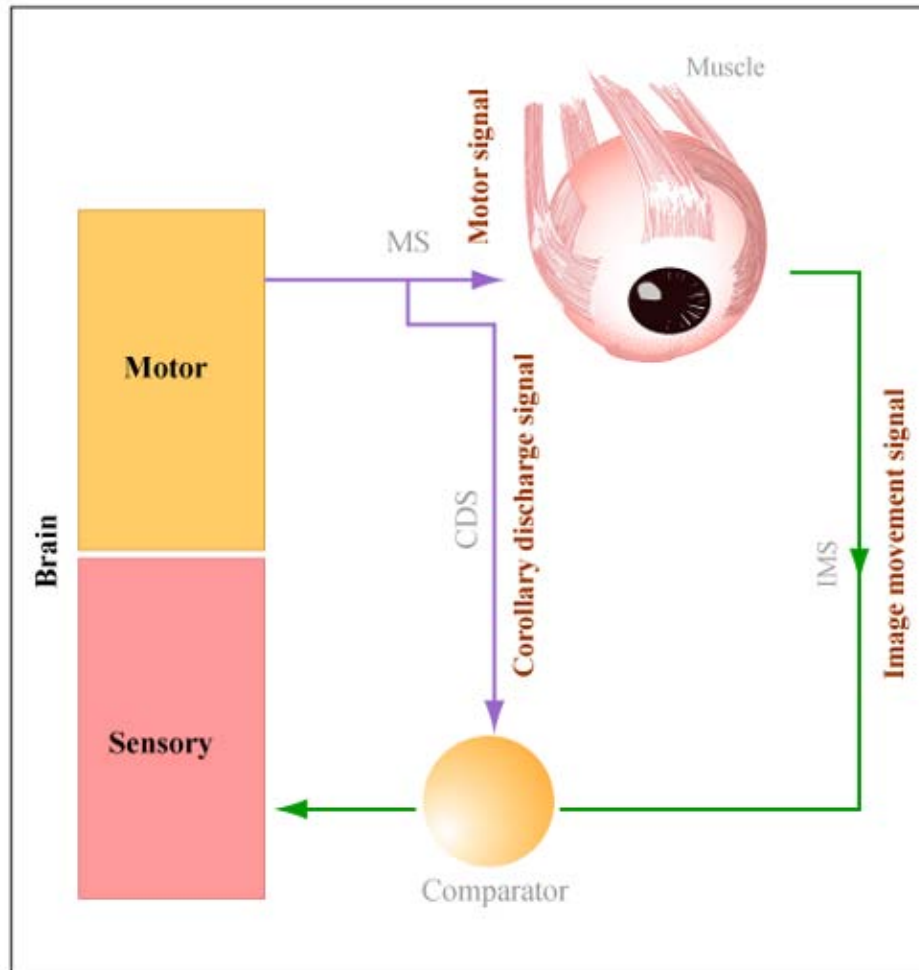The corollary discharge model (Teuber, 1960)

Figure by MIT OpenCourseWare.

Predictions: 1. Pushing on the eyeball would cause the world to --------
   2. A stabilized after-image would appear to ------- when the eye is moved voluntarily
   3. If your eye was paralyzed with curare and you then attempted to move it, you would see the world --------

Motion and inference.

- http://www.michaelbach.de/ot/mot_bounce/index.html

- http://www.michaelbach.de/ot/mot_motionBinding/index.html

Seeing from motion

- http://www.biomotionlab.ca/Demos/BMLwalker.html

Fun

- http://www.michaelbach.de/ot/mot_mib/index.html