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](http://www.michaelbach.de/ot/mot_flashlag1/flashlag-fillin-2.swf)
Post-diction

Motion Integration and Postdiction in Visual Awareness

David M. Eagleman\(^{1,2,3,4}\) 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?
Accounting for eye-motion (contd.)

The corollary discharge model (Teuber, 1960)

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 --------

Figure by MIT OpenCourseWare.
Motion and inference.

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

• http://www.biomotionlab.ca/Demos/BMLwalker.html
Fun

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