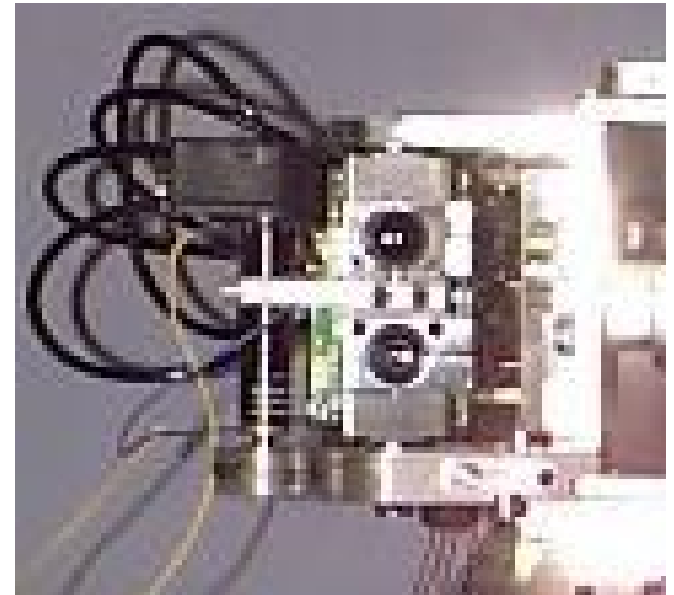


# Active Vision: 3D structure from motion

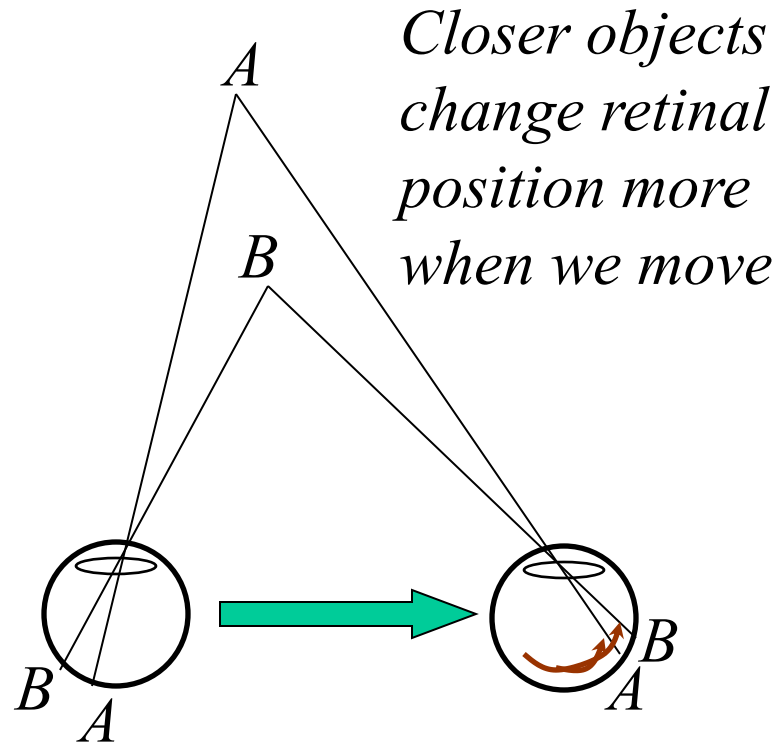
Robert B. Fisher  
School of Informatics  
University of Edinburgh

# Eye movements and localisation

- Knowing where the eye/camera is pointing tells us the direction of objects of interest (requires proprioception to know relative angles)
- Can also extract depth through motion parallax



# Motion Parallax



*Geometrically equivalent to  
binocular stereopsis*

# Demo



# Motion perception

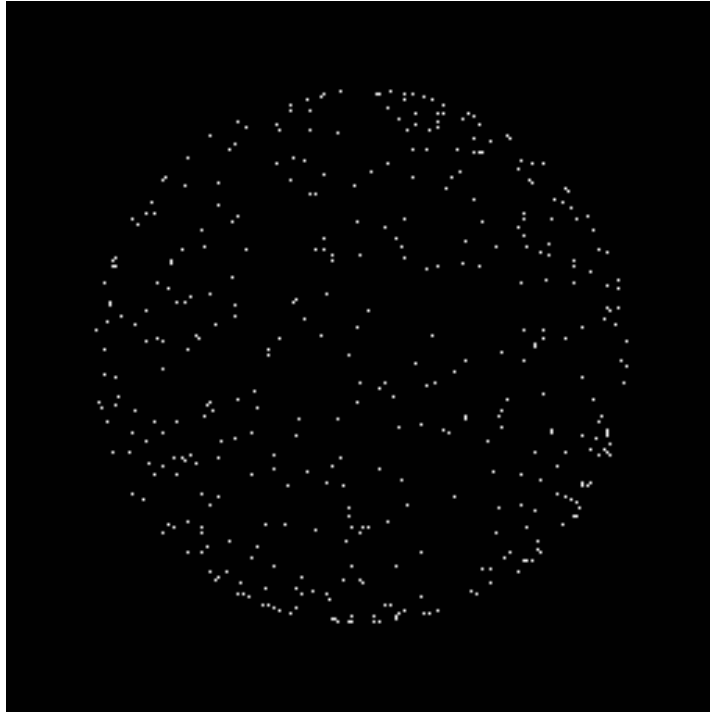
- Like parallax, much important information about the world comes from sensing visual motion
- E.g. breaking camouflage, sensing self motion, seeing what is happening...
- ‘Active vision’ sometimes taken to mean vision based on sequences of images

# Explanation



# Structure from motion

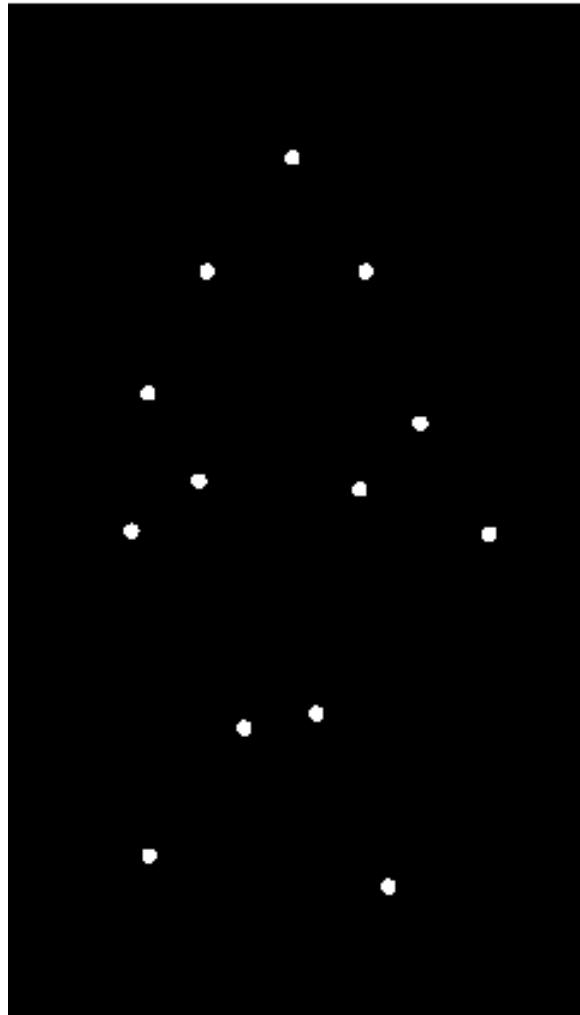
- Motion field contains information about the 3-d structure of objects (e.g. strong depth effect)



- If rigid body, and can track points, can geometrically recover structure of scene and movement of camera - active field in Computer Vision.

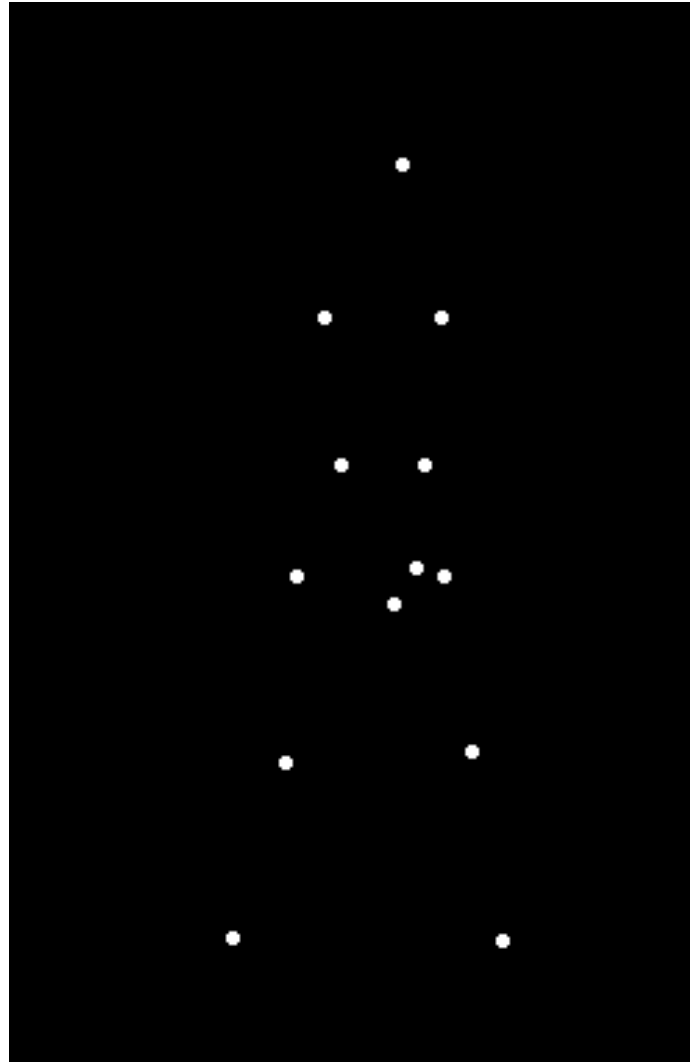
# Structure from motion 2

What is this?





# Structure from motion 3



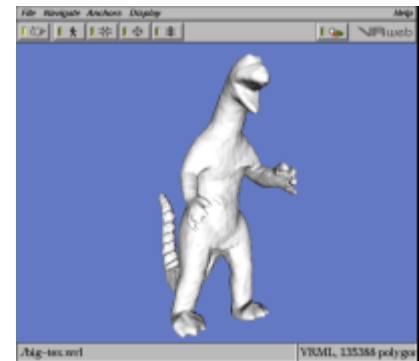
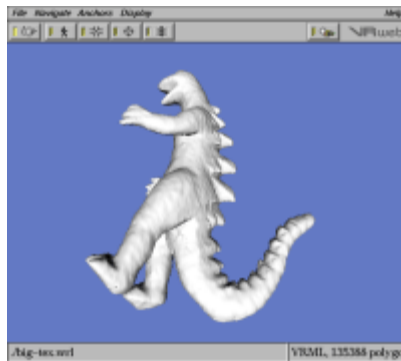
3D structure emerges from pattern of motion

# Structure from motion

Source images



Reconstructed from tracked feature points:



# Lecture Overview

- + Motion gives relative depth cues / parallax
- + Can perceive 3D structure from relative motion
- + Can reconstruct 3D structure from sequence of views of an object