Introduction to Computer Vision

Michael J. Black

Sept 2009

Lecture 4: Introduction

Review

- Formalizing the “tricks” of artists.
- Vision as inverse graphics
  - Build an internal “model” of the world
- Too many parameters to do this in practice
  - We have to make some assumptions
  - Represent our beliefs about what is typical (priors); e.g. light from above
- Maybe our model isn’t as good as we think

Goals

- What happens when the cues are weak?
- What can be extracted “bottom up”?
- Begin talking about object detection and recognition

Computer Vision

Is it more than inverse graphics?

How do you recognize the banana?

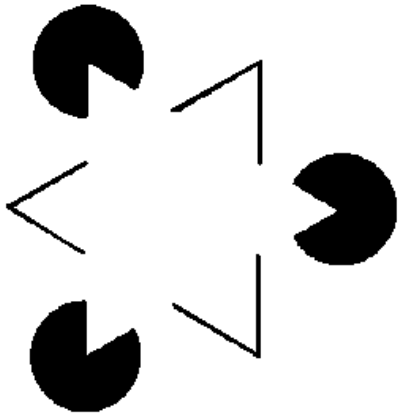
How can you get a computer to do this?

Object Recognition

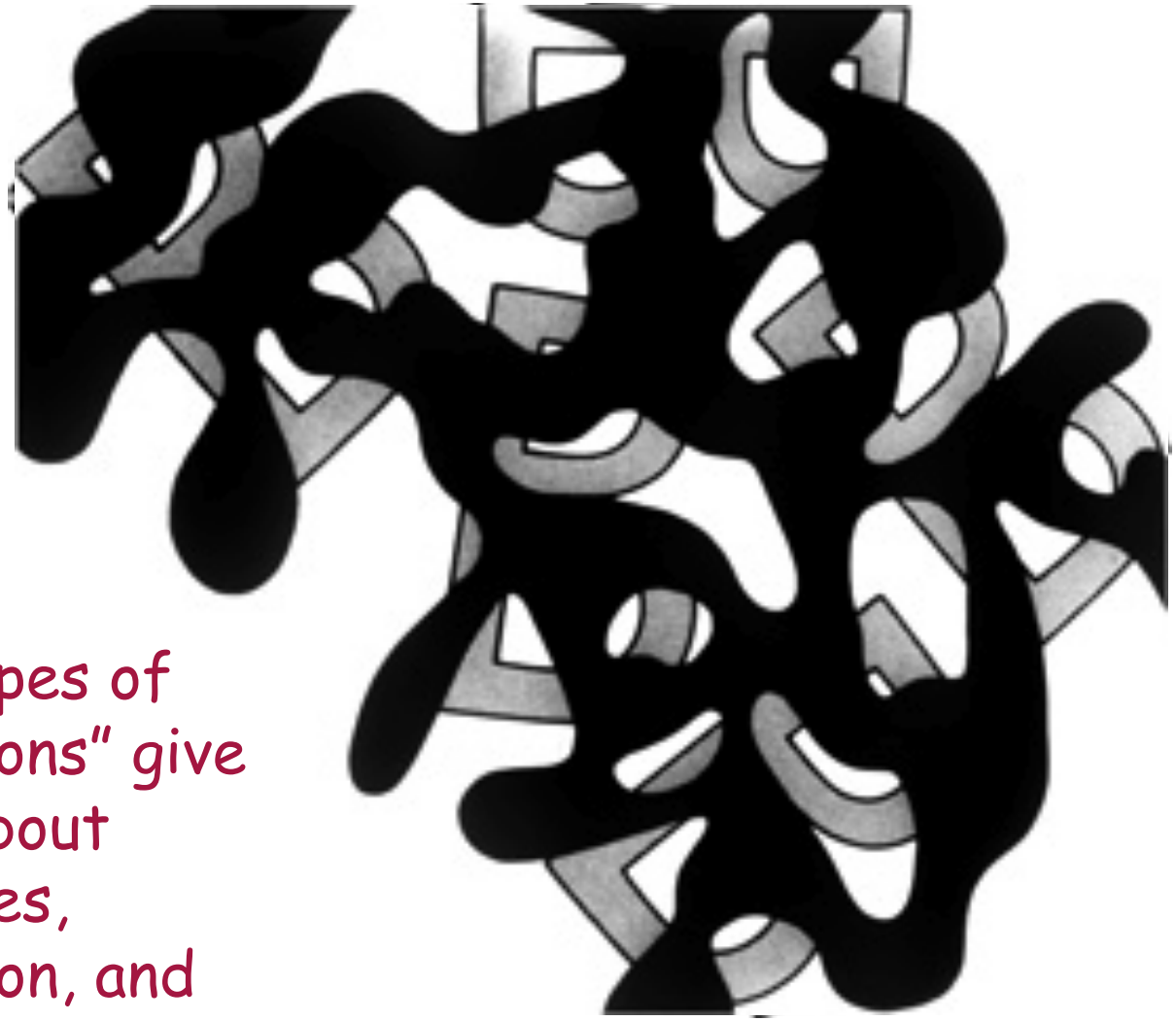
Barrow and Tenenbaum

Subjective Contours

Perceptual Organization



Kaniza Triangle.



The types of "junctions" give cues about surfaces, occlusion, and light.

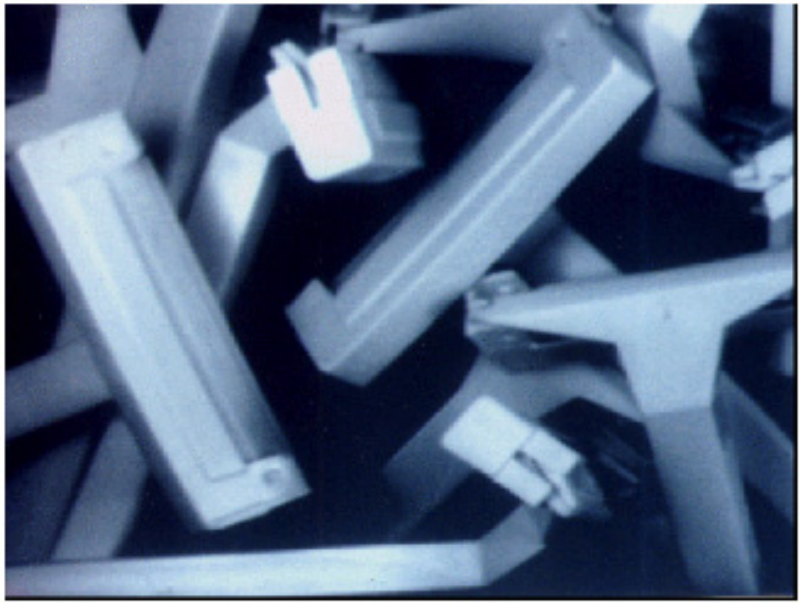
I. Rock, The Logic of Perception, 1983.

What goes with What

So maybe we need some sort of perceptual organization process that tells us what “low-level” measurements might “group” together.

Then what? How do can we “recognize” objects?

Assignment 0 – In Class



• Formalize the problem of detecting the the known objects in this scene; that is their 3D pose (translation and rotation).
• List a set of steps the computer has to do at a high level but make sure that these steps are “implementable”.