Robots with Vision that Find Objects

Yiannis Aloimonos & Cornelia Fermuller

Problem

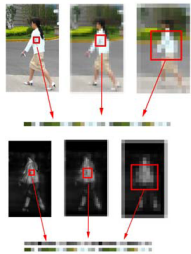A robot is instructed in language to locate generic objects in a room.

Overview of the Approach

1. Attention mechanism
2. Fixation-based segmentation
3. Shape based object descriptions

Attention Mechanism

Object filter: Training a recurrent multilayer perceptron algorithm

Algorithm:
1. Collect multi-scale patch samples.
2. Compress using PCA.
3. Train a multilayer perceptron classifier.
4. Run the classifier on the images.
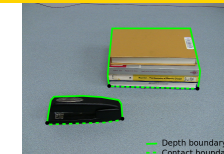5. Return to step 1, but collect samples from original and from results of step 4.
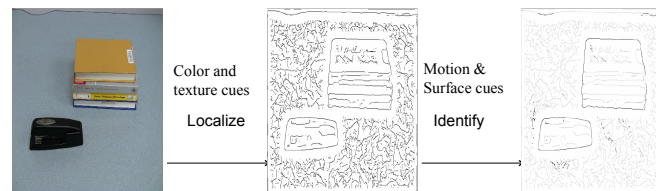
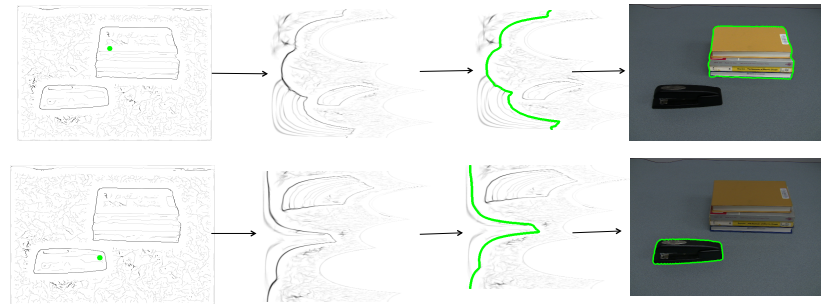## Attention Results

Utensil filter

Segmentation Definition

An object is a region enclosed by depth + contact boundary

Depth boundary
Contact boundary

Localize and Identify Object Boundaries

Color and texture cues
Localize

Motion & Surface cues
Identify

Segment a Fixated Region

Segmentation Results