



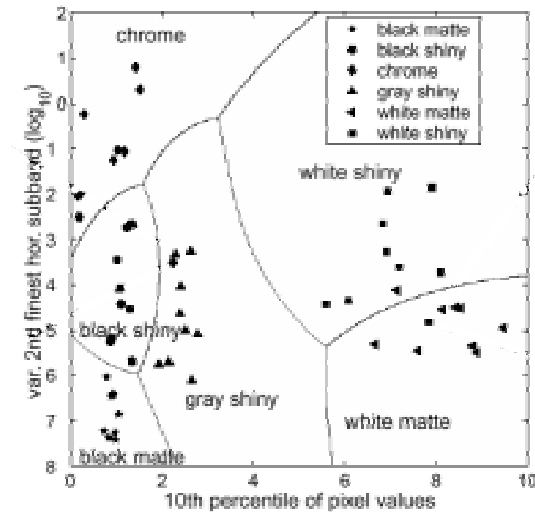
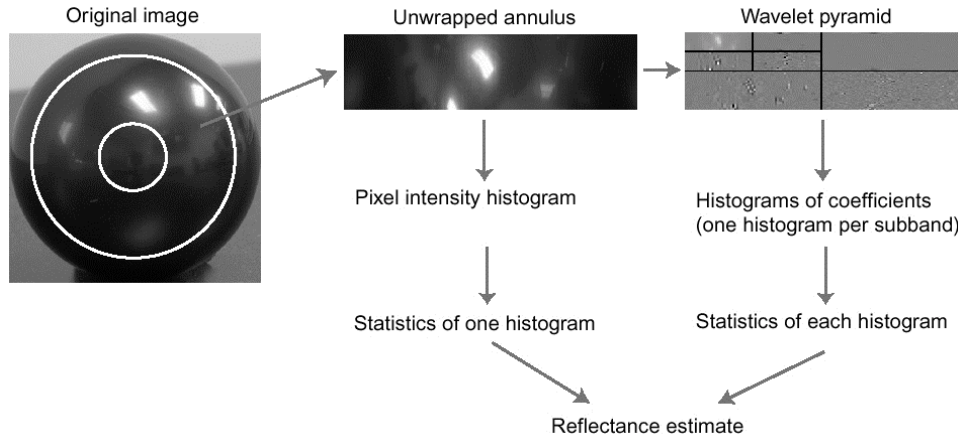
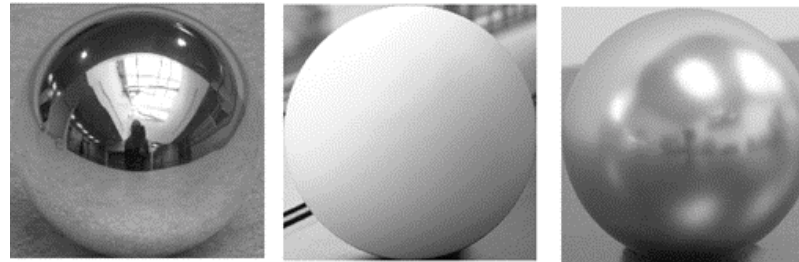
Project Overview

- It is important to recognize materials -- the “stuff” that objects are made of.
- Example: a domestic robot must distinguish between a pile of sugar and a blob of cream cheese in order to clean up properly.
- Other example uses:
 - Grasping an object: is it glass, metal, or rubber?
 - Locomotion over terrain: is it icy, or snowy, or wet, or sandy?
 - Mineralogy: how to classify minerals by their appearance?
 - Medicine: is this a melanoma or a normal mole?



Progress Through December 2000

We use spheres for simplicity. We train a system by showing multiple spheres, with various reflectance properties, in several illumination conditions.



The system tries to classify a sphere image it has not seen before, using statistics of wavelet coefficients and pixel intensities.

With 2 features, it is pretty good.
With 5 features, it is very good.



Research Plan for the Next Six Months

- Extend estimator to handle objects that are more complex than spheres.
- Gather more data on real-world illumination statistics.
- Relax requirements for known geometry.
- Develop principled methods to choose best image statistics for classifier.