What Is Imaging Science?

What is an Image? Examples...

Vacation photograph taken with film

X-ray Image

Television Program
Define: Image

- A visual representation of some measurable physical "property" of "something"
  - e.g., a person, object, event, or phenomenon
  - Examples of Physical Properties
    - reflectance, transmittance, absorptance, ...
- Images can be formed of the different physical properties of the same object. Each conveys different "information" about the object
  - Magnetic Resonance Image (MRI), Computed Tomogram (CT or CAT), Positron Emission Tomogram (PET)

Imaging technology is changing rapidly

- Consumer film business is declining at about 30% per year
- Digital camera sales growing at 15+% per year
- Many, many more photos
- Many, many fewer prints
  - only about 13% of digital images are printed
  - WHY?
    - electronic viewers (Kodak EasyShare™, Google Picasa™)
Images and Object Properties

- Reflected light captured on a light-sensitive emulsion, often called film
- Transmitted x-rays captured on X-ray sensitive material.
- Reflected light over time (3-D) converted to 1-D electronic signal that is broadcast, received, then converted back to a series of images!

Some Examples of Imaging Systems

- System: the device that creates the image
  - Photograph: Camera, emulsion, processing
  - X-ray: X-ray source, film
  - Television: Video Camera, CRT receiver, etc.

More Examples...

- Temperature map (temperature)
- Ultrasound Imaging (acoustic reflectivity)
- Radar (microwave reflectivity)