



Imaging Science
 Fundamentals
 SIMG-215
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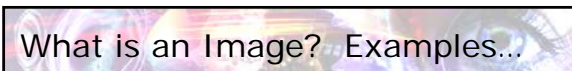
Class Website:
<http://www.cis.rit.edu/class/simg215>

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What Is Imaging Science?

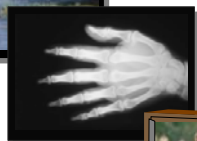
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What is an Image? Examples...



Vacation photograph taken with film



X-ray Image



Television
 Program

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Other Examples

- Image from Weather Satellite
- Radar Image
- Sonar (ultrasound) Image
- Hologram
- Atomic Force Micrograph
- X-Ray Computed Tomography
- Magnetic Resonance Image
- Positron Emission Tomography
- ...

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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)

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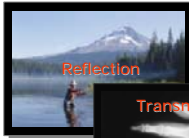
Imaging technology is changing rapidly

- 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*[™])

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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 series of images!

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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.

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More Examples...



Temperature map (temperature)



Ultrasound Imaging (acoustic reflectivity)



Radar (microwave reflectivity)

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