**Data Hiding**

**Steganography and Watermarking**



• Information Hiding is a general term encompassing many sub-disciplines

• Two important sub-disciplines are:

Steganography and Watermarking

**– Steganography**:

Hiding: keeping the existence of the information secret

– **Watermarking**

Hiding: making the information imperceptible

• Information hiding is different than cryptography (cryptography is about protecting the content of essages)

**The Need for Data Hiding:**

• Covert communication using images (secret message is hidden in a carrier image)

• Ownership of digital images, authentication, copyright

• Data integrity, fraud detection, self-correcting images

• Traitor-tracing (fingerprinting video-tapes)

• Adding captions to images, additional information, such as subtitles, to video, embedding subtitles or audio tracks to video (video-in-video)

• Intelligent browsers, automatic copyright information, viewing a movie in a given rated version

• Copy control (secondary protection for DVD)

**Issues in Data Hiding**

Perceptibility: does embedding information ―distort‖ cover medium to a visually unacceptable level (subjective)

Capacity: how much information can be hidden relative to its perceptibility (information theory)

Robustness to attacks: can embedded data survive manipulation of the stego medium in an effort to destroy, remove, or change the embedded data

Trade-offs between the three:

1. More robust => lower capacity

2. Lower perceptibility => lower capacity etc.