


Secure Content Distribution: How does Watermarking help?

Farid Ahmed and Fahmida Rahman
Electrical Engineering & Computer Science
The Catholic U of America
Washington, DC 20064

The background of the slide features several decorative elements consisting of concentric circles in shades of blue, resembling ripples in water. These circles are scattered across the lower half of the slide, with a prominent one in the bottom center and others towards the bottom right.

Outline

- What are the Issues in Secure content distribution and preservation?
- How is it related to Academia?
- What is Digital Watermarking (DWM)?
- How does DWM facilitate DRM?

Issues in Secure Content Distribution and Preservation

- Security Objectives
 - Confidentiality
 - Integrity
 - Authenticity
 - Non-repudiation
 - Availability
- Security Technologies
 - Cryptography
 - Watermarking

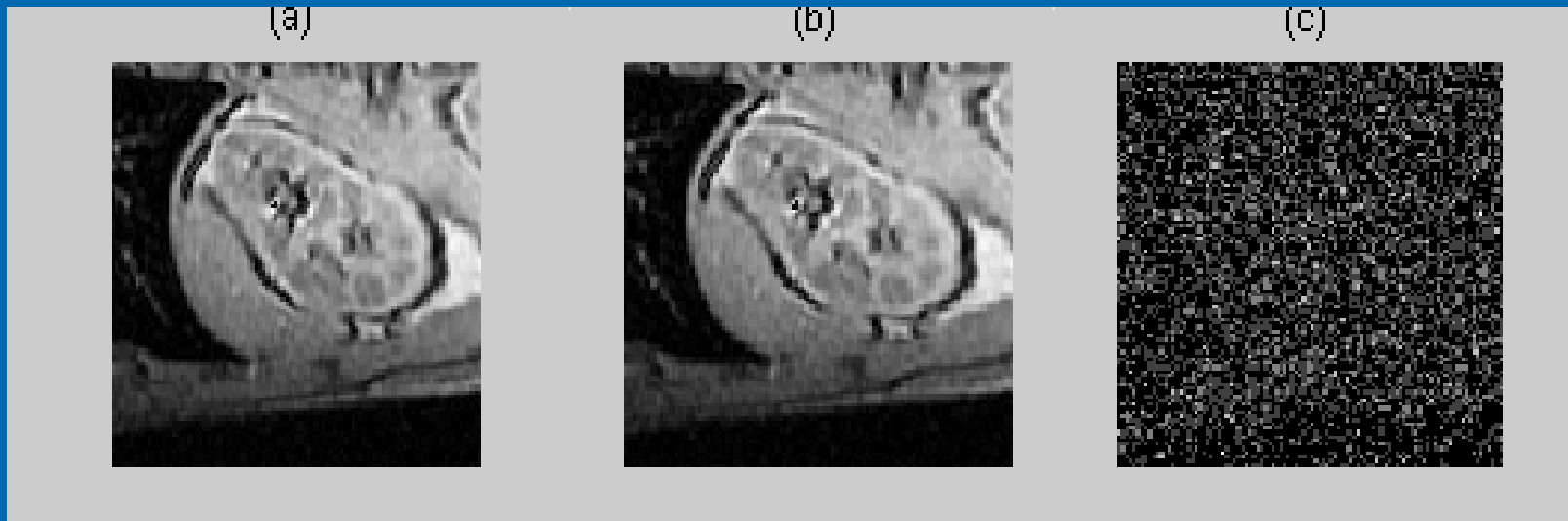
Academic Connection

- Protection of Intellectual Property (IP)-
Textbook, Publications, Patents etc.
- Dissemination and sharing of
instructional and research scholarship
- Secure Digital Library Initiative

Digital Watermarking- What?

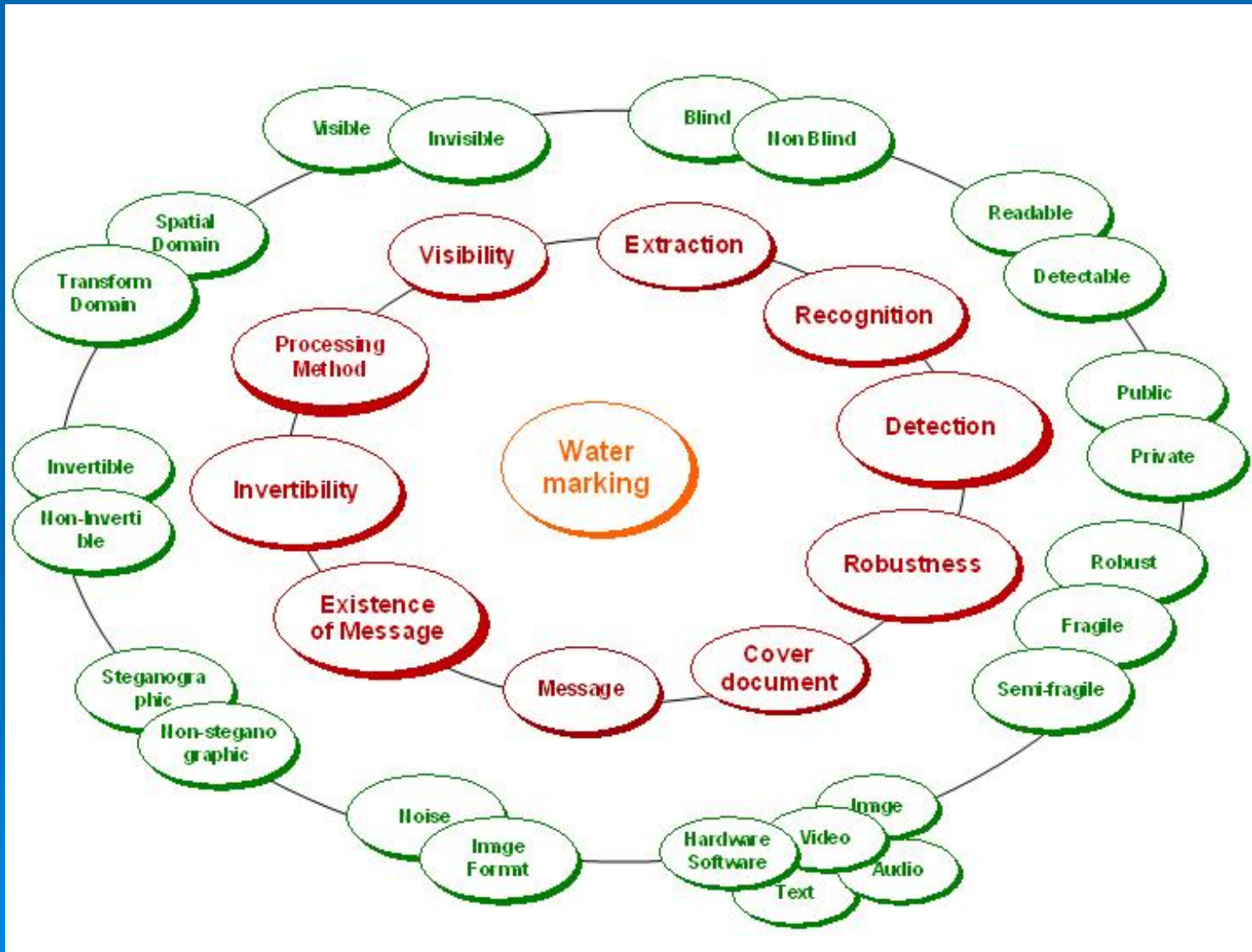
- Digital watermarking is the process of embedding a *digital message* into a *digital content* like image, audio, or video
- Multidimensional problem
 - Imperceptibility
 - Robustness
 - Capacity
 - Detectability

Watermarking Example



- Patient Information or EPR can be embedded in patient medical images for 'Security' purposes (Confidentiality, Integrity, Authentication etc.)

Watermark Classifications



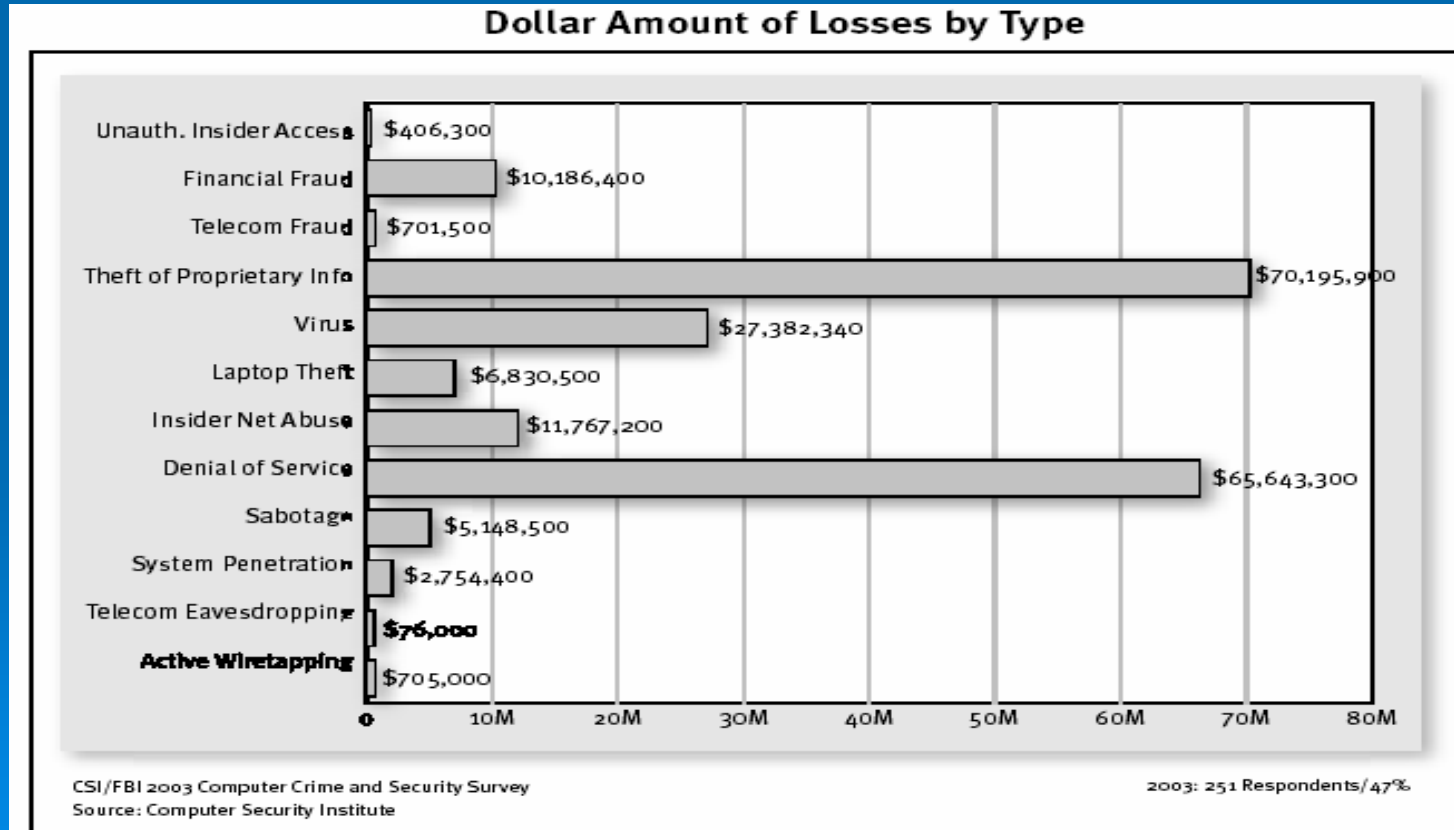
Digital Rights Management

➤ DRM is about

- Digital Content. *Born Digital, Converted Digital, and Induced Digital*
- Rights- Intrinsic and Extrinsic. Digital Rights are Fuzzy.
- Management- Regulatory (Control), Non-Regulatory (Facilitation of use, enhancement of rights, classification of use)

DWM for DRM

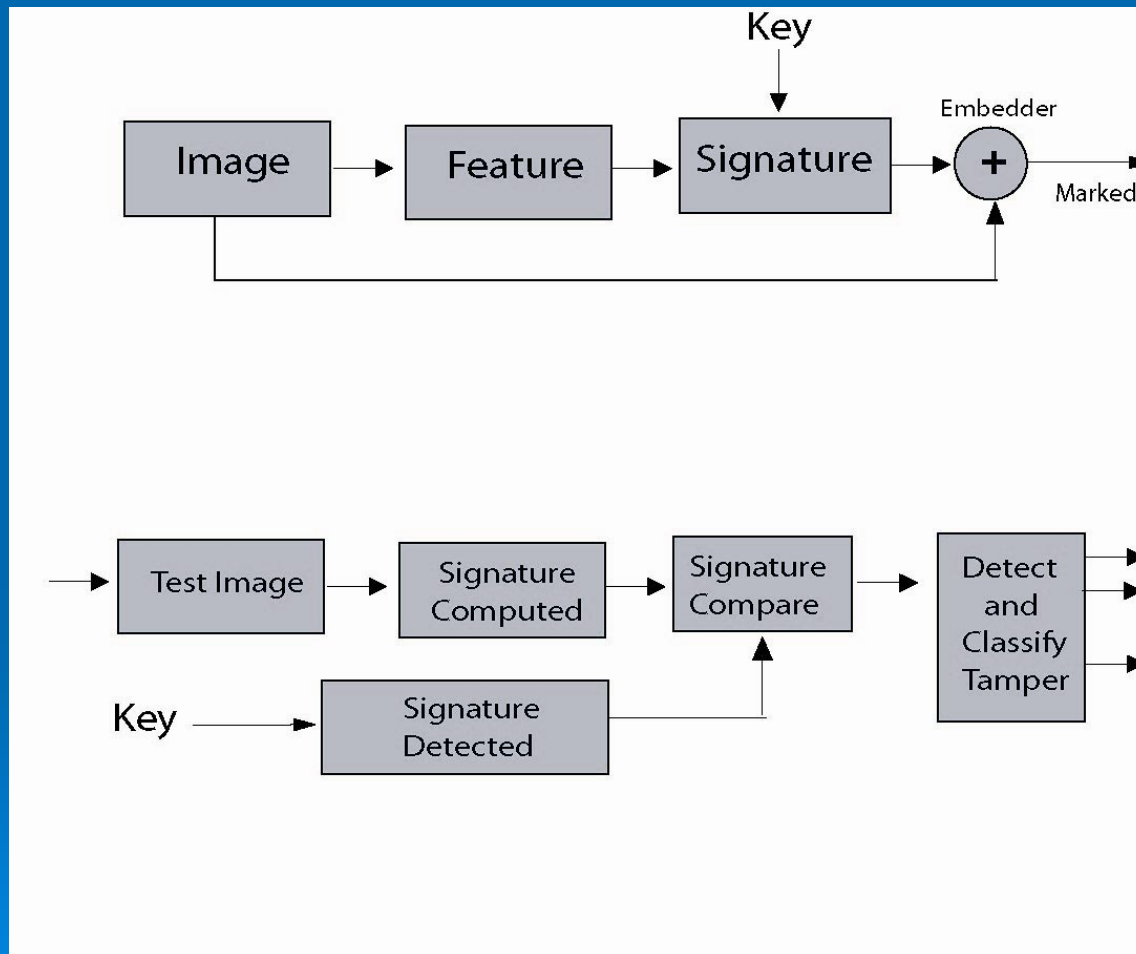
- Security Enhancement- Copyright protection, Copy Control, Access Control



DWM for DRM

- Enabling Technologies
 - Intelligent Multimedia
 - Bridging the print and digital world
- Identification
 - Annotation
 - Data Mining
- Forensic Analysis
 - Transaction Tracking/Fingerprinting
 - Authentication/Tamper Detection

An Authentication Watermark



Limitations of DWM

- Yes, it is subject to a number of attacks- Forging, Removal, Distortion.
- Quality Degradation of Digital Content
- Not Standardized yet
- The marriage of watermarking and cryptography can address the secure distribution issues better.

Final Words

- Technological solution is to keep honest people honest and bad people at a bay by making the circumvention of technological protection harder.
- Solutions to Security Problems are multi-faceted- legal, technical, ethical, and economic.
- With the strength and weaknesses, technology can set the boundary values of law and facilitate enforcing the law.