

Watermarking (cont.)

E.g.,
advertising
vs. selling
of digital art
online

• Watermarking vs. Steganography

	Requirements	Watermarking		Steganography
		Private	Public	
Goal	Protection of intellectual property rights	++++		–
	Transmission of secret message without raising suspicion	–		++++
Specifications	Perceptual invisibility	++++		+++++
	Statistical or algorithmic invisibility (even copy)	+		+++++
	Robustness against hostile removal, destruction, or counterfeiting	+++++		–
	Resistance against normal signal processing	++++		+
	Capable of surviving common compression coding	++++		++
	Large payload	++		++++
Detection/ Extraction	Extractability/detectability without key	–	++++	++++
	Extractability only with presence of key	++++	–	–
	Requirement of low complexity in extraction/detection	++		+++
Note: Crucial: +++++ Necessary: ++++ Important: +++ Desirable: ++ Useful: + Unnecessary or irrelevant: – Public watermarking schemes do not need the host signal in detection/extraction; private schemes require the presence of the host.				

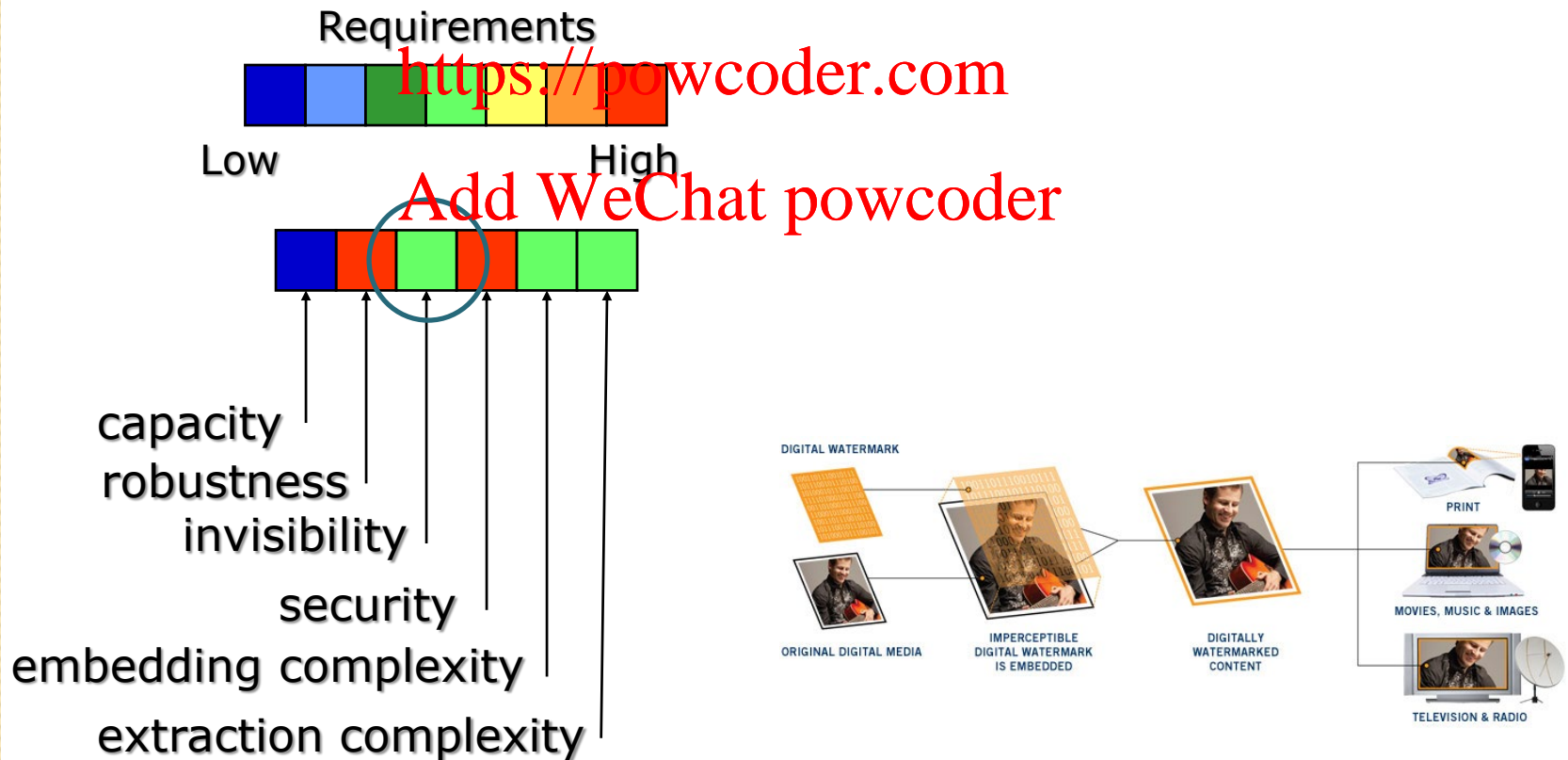
Watermarking (cont.)

- **Watermarking - Common Applications**

- ◆ **verify the owner of a digital object - copyright protection**

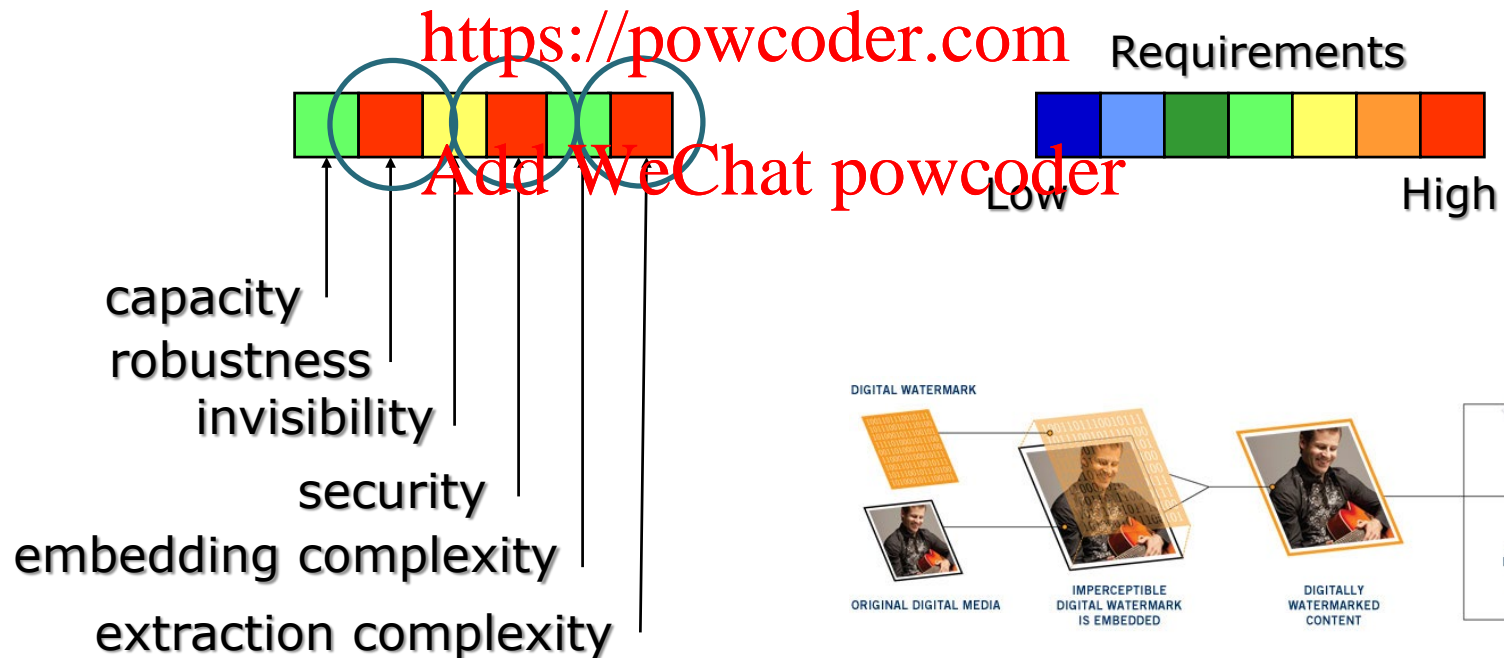
- placing a (unique) watermark = placing a (unique) signature

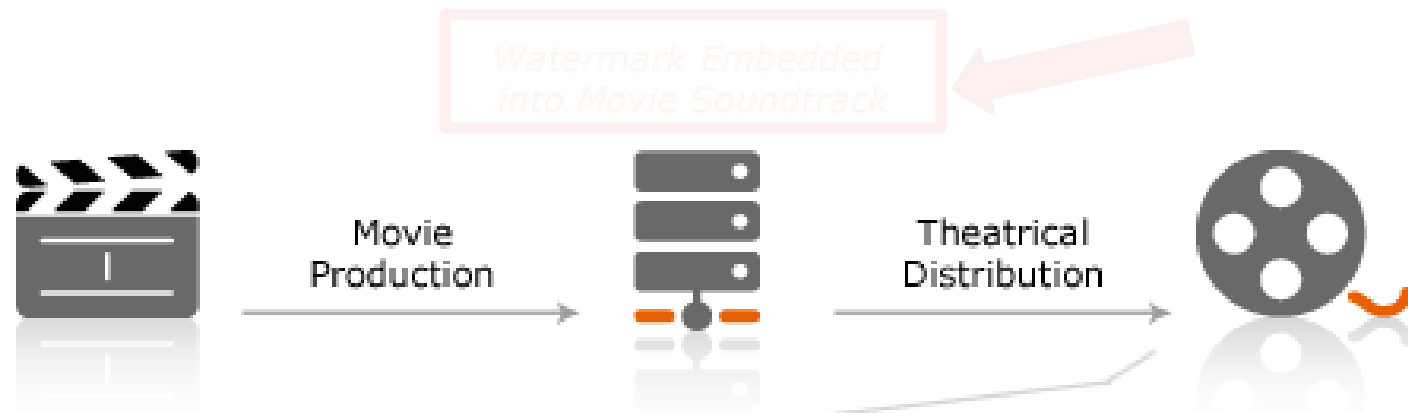
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Watermarking (cont.)

- **Watermarking** - Common Applications
 - ◆ identify illegal '*theatrical release*' copies of a movie: watermark prior to release to prevent movie piracy
 - copy control in DVD player





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<https://powcoder.com>

Add WeChat powcoder

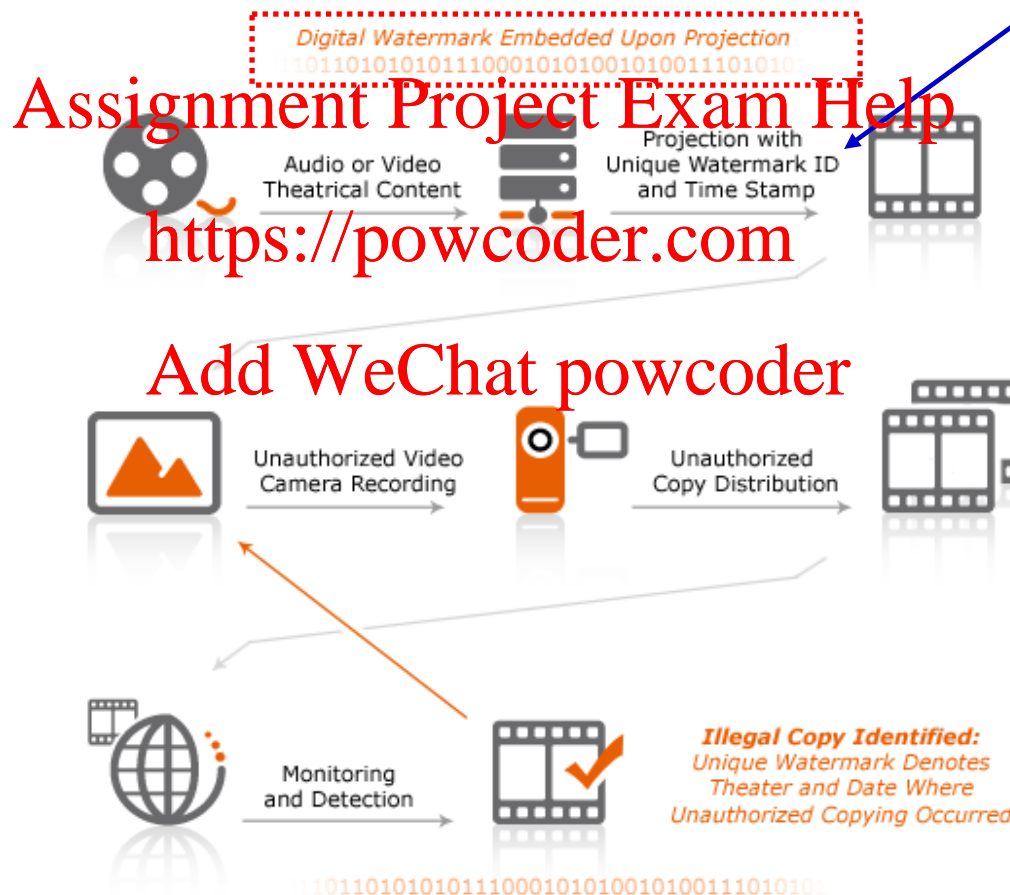


Watermarking (cont.)

- **Watermarking - Other Applications**

- ◆ forensics and piracy deterrence

each showing
of the movie
has a unique
watermark



Watermarking (cont.)

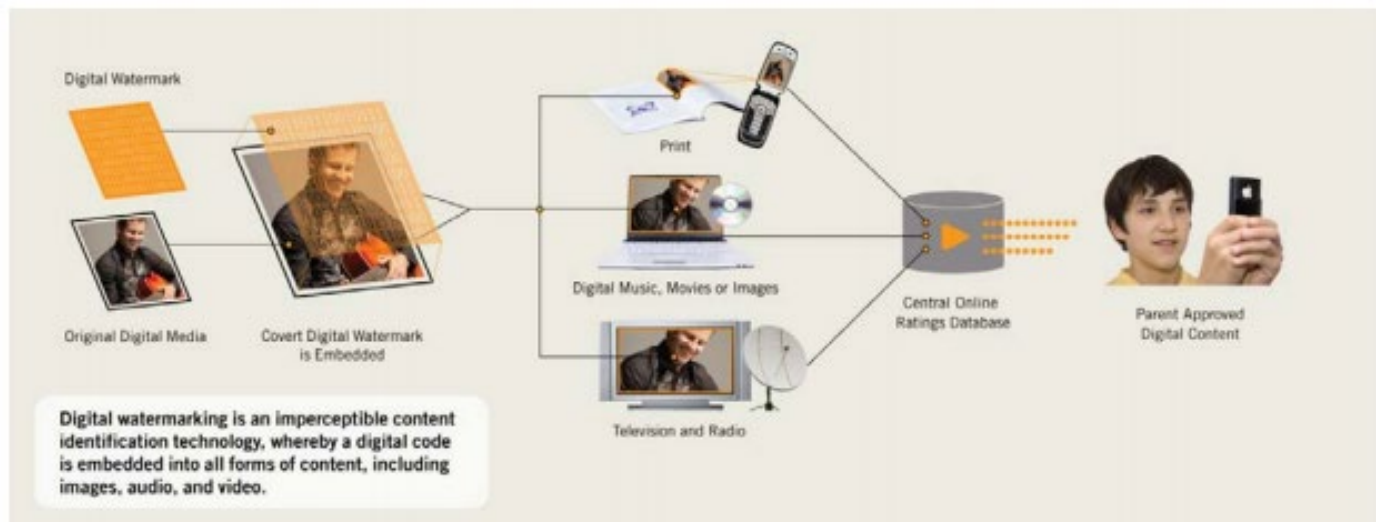
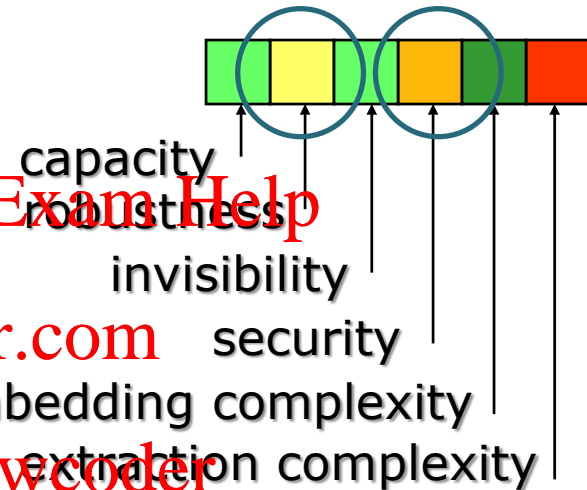
- **Watermarking - Other Applications**

- ◆ **content filtering**

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Add WeChat powcoder

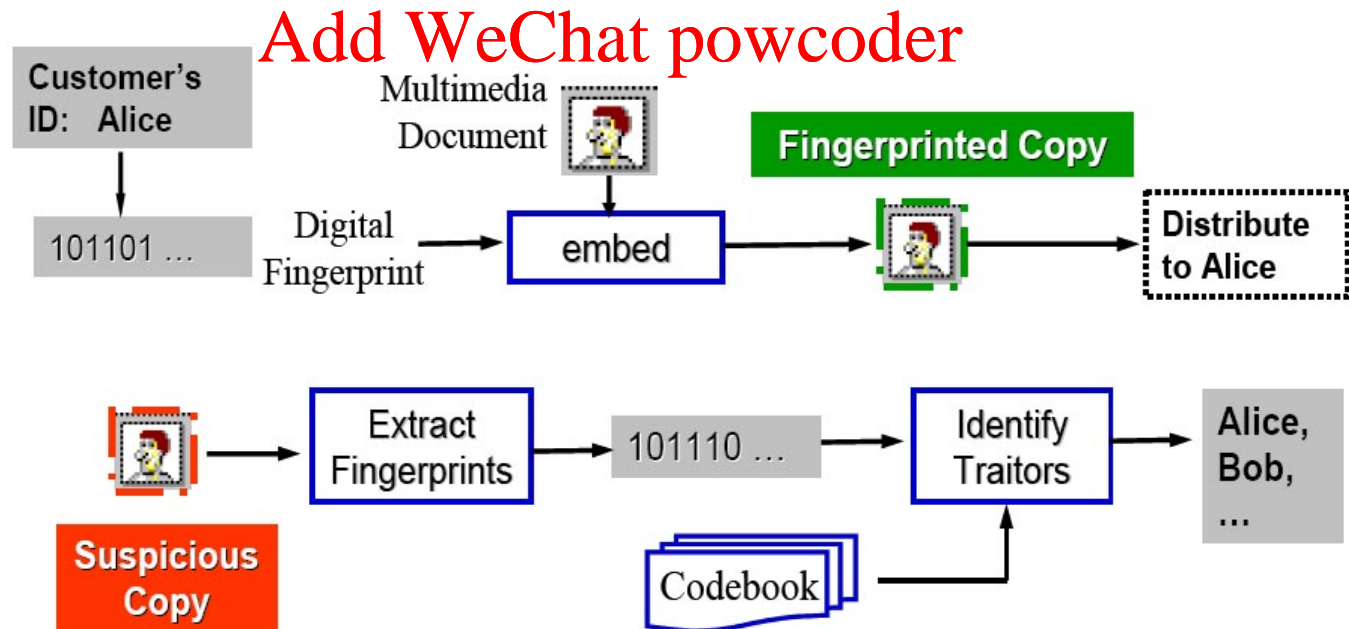


Digital Fingerprinting

- **Digital Fingerprinting**

- ◆ process of embedding unique information for each user-copy of a digital object in order to be able to identify entities involved in illegal distribution of the digital object

- if object with Alice's ID is found on Bob's computer =>
copy is illegal AND likely provided by Alice



Digital Fingerprinting (cont.)

◆ requirements of digital fingerprinting

