Steganography

Definition

Steganography is the science and art of covert communication by embedding a secret message within a non-secret (cover) medium so that the existence of the message is concealed. Etymology: **Greek 'steganos' (covered) + 'graphein' (writing).**

Comparison with Related Concepts

Aspect	Steganography	Cryptography	Digital Watermarking
Goal	Hide existence of message	Scramble content to be unreadable	Assert ownership/authenticity
Visibility	Ideally imperceptible	Ciphertext visibly random	Often imperceptible but detectable
Detection Risk	Detection ⇒ failure	Detection expected	Detection acceptable
Removal	Attacker tries to detect/extract	Attacker tries to decrypt	Attacker may try to remove/alter

Generic System Model

Inputs: Cover medium C, secret message M, optional stego key K. The embedding function f produces stego object $S = f(C, M, K)$. Extraction uses inverse function g with K to recover M (or verify its presence).

Block Diagram:
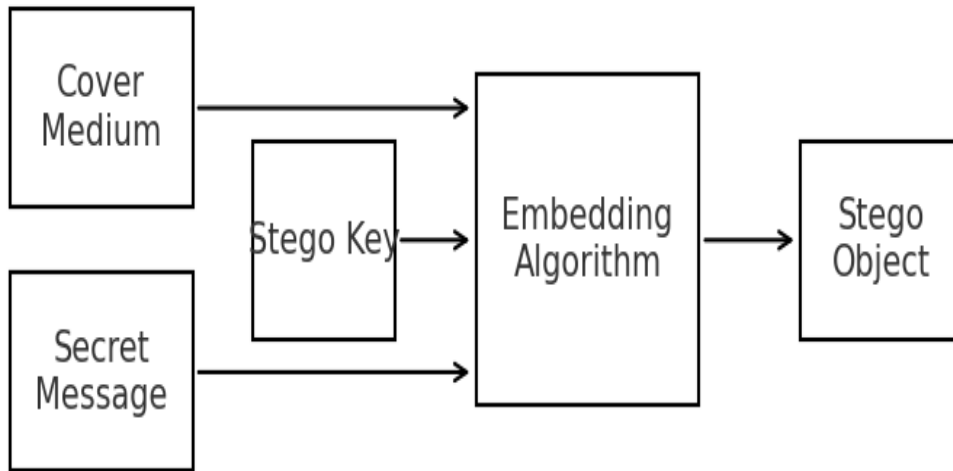
Classification by Cover Type

- Text Steganography (formatting, whitespace, linguistic methods).
- Image Steganography (spatial: LSB; transform: DCT, DWT embedding).
- Audio Steganography (LSB, phase coding, echo hiding).
- Video Steganography (frame-wise spatial/transform embedding).
- Network/Protocol Steganography (manipulating headers, timing).