

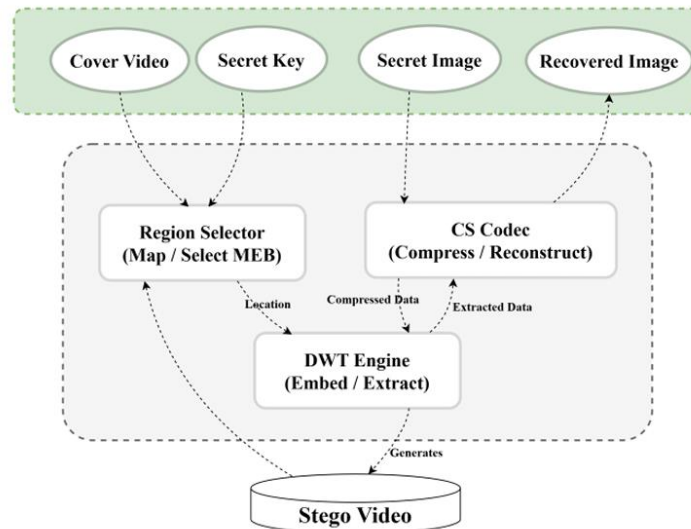
Maximum energy block: a strategy for high visual security multi-image steganography

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Problems & Ideas

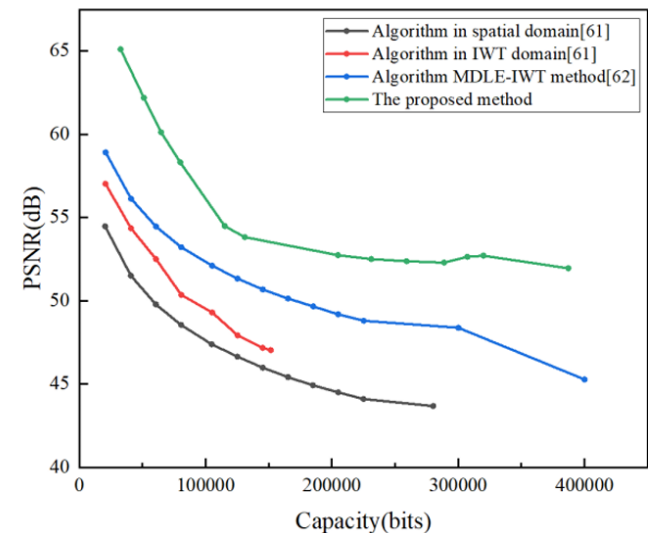
- Problems:
 - Trade-off Challenge: High hiding capacity in multi-image steganography is often limited by visual security.
 - Passive Embedding: Most existing methods passively accept given carrier regions, ignoring the sensitivity of the Human Visual System, leading to detectable distortions .
- Ideas: An active Maximum Energy Block (MEB) strategy to selectively embed data in high-texture regions, combined with 2D-CS and SHA-256 mapping.



System interaction diagram of the modular steganography framework, showing the three core components: CS Codec, Region Selector, and DWT Engine.

Main Contributions

- Contributions:
 - Maximum Energy Block (MEB) strategy is proposed to optimally select steganography regions in cover media, thereby minimizing detectable distortions;
 - Both hiding capacity and security are enhanced by utilizing the multi-frames and multi-channels cover carrier and by pre-processing secret images with 2D compressive sensing;
 - Immense hidden capacity together with high visual security is simultaneously achieved, effectively resolving the classic trade-off.



Left: The stego frames show high visual fidelity with no observable artifacts. Right: Quantitative comparison demonstrates that the proposed method maintains higher PSNR than state-of-the-art methods as embedding capacity increases.