

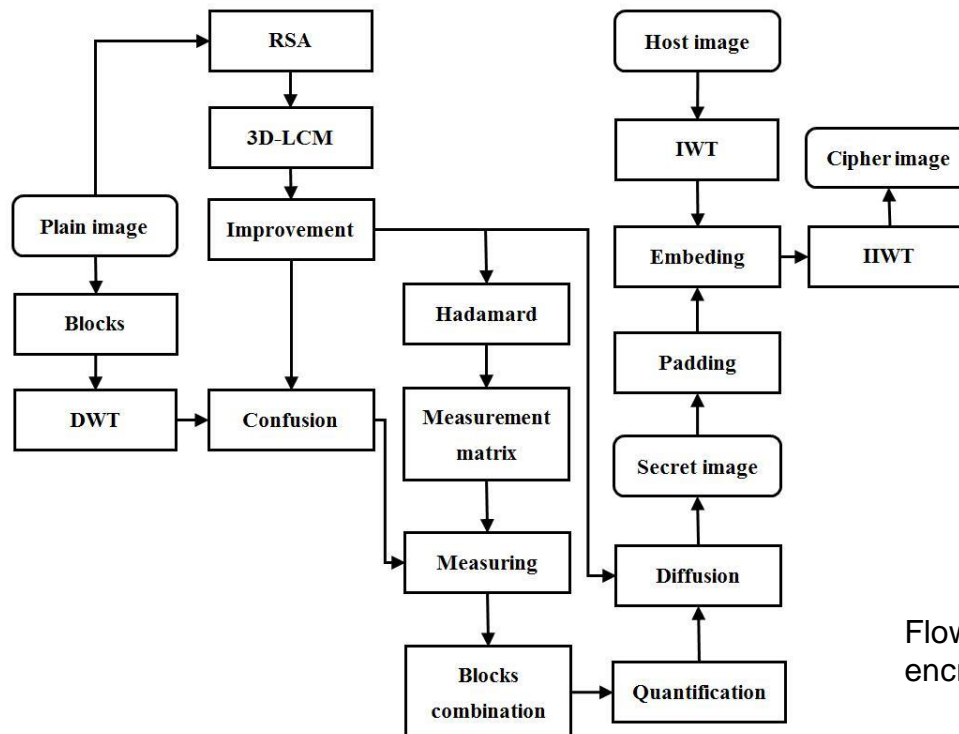
Meaningful image encryption algorithm based on compressive sensing and integer wavelet transform

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Problems & Ideas

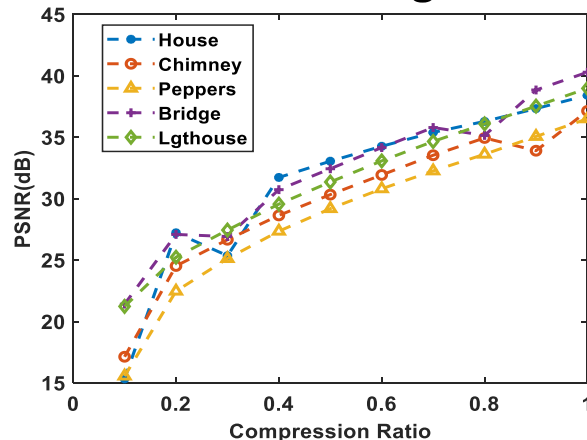
- Problems of current image encryption methods:
 - Do image encryption by changing meaningful plain image into noise-like or texture-like form cipher image.
 - Key dependence only to produce the keystream.
- Ideas: A new meaningful image encryption algorithm based on compressive sensing (CS) and integer wavelet transformation (IWT) is proposed with the help of RSA and chaotic map.



Flow of the proposed image encryption algorithm

Main Contributions

- Contributions:
 - A new mathematical model is set up to preprocess and improve the behavior of the randomness of random sequence;
 - The measurement matrix for CS is constructed by using Hadamard matrix and random sequence generated by chaotic map, which not only maintains the original characteristics of Hadamard matrix, but also has the architecture of control and synchronization in chaotic map;
 - The initial values of chaotic map are generated by asymmetric RSA, which is convenient for key management and avoids extra transmission;
 - The secret image is inserted and expanded before embedding, so that the hiding effect and the image reconstruction effect can show better.



Most of the PSNR values are bigger than 30dB when the compression ratio is 0.5.