1 hour read summary on steganalysis

Notebook:	Machine learning		
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URL:	https://www.kaggleusercontent.com/kf/33982078/eyJhbGciOiJkaXIiLCJlbmMiOiJBMTI4...		

Ref : https://www.kaggle.com/prashant111/alaska2-image-steganalysis-all-you-need-to-know

1. Introduction to Steganalysis
    - Steganalysis is the study of detecting hidden messages using steganography.
    - goal
        - identify suspected packages
        - determine payload encoded in them
        - recover payload
    - Diff with crypt analysis: steganalysis generally starts with a pile of suspect data files, but little information about which of the files, if any, contain a payload.
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2. The difference between Steganalysis and Steganography
    - Steganography is the practice of concealing a file, message, image, or video within another file, message, image, or video.
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3. Steganographic methods

    - 3.1 Spatial domain
        - substitution techniques
        - create a covert channel in cover image
            - Least Significant Bit (LSB) of the image data
    - 3.2 Transform domain
        - areas of the image that are less exposed to compression, cropping, and image processing.
    - 3.3 Spread Spectrum Technique
        - below the noise level for any given frequency
        - the cover image as noise or tries to add pseudo-noise to the cover image
    - 3.4 Statistical Method
        - model-based techniques
        - typically small
        -
    - 3.5 Distortion Techniques
        - require knowledge of the original cover image during the decoding process where the decoder functions to check for differences between the original cover image and the distorted cover image in order to restore the secret message

4. Characteristics of a Strong Steganography method

1. **Capacity**
2. **Invisibility**
3. **Undetectability**
4. **Robustness**
5. **Tamper resistance**
6. **Signal to noise ratio (SNR)**

5. Performance measure
    1. **peak-signal-to-noise ratio (PSNR)**
    2. **Structural Similarity (SSIM) Index quality assessment index**
6. Steganalysis approaches

    - 6.1 Specific or Target Steganalysis
        - **steganographic algorithm (SA)**
        - **advantage - very accurate**
        - **disadvantage - limited to particular algo**
    - 6.2 Blind or Universal Steganalysis
        - **scientific research focuses on universal steganalysis**

7. Steganalysis Methods and Techniques

    - 7.1 Statistical Steganalysis
        - **spatial domain**
    - 7.2 Steganalysis Machine Learning Techniques
        - **Feature Extraction**
        - **Classification**
            - **Multivariate regression**
            - **FLD**
            - **SVM**
    - 7.3 Steganalysis Deep Learning Models
        - CNN

8. Steganalysis Tools
    1. StegDetect
    2. Stirmark
    3. StegBreak
    4. StegSecret
    5. JPSeek
    6. 2Mosaic
9. Study of Image Steganalysis Techniques
    1. Visual Analysis
    2. Statistical Analysis
10. Applications of Steganalysis
11. Credits