Exam questions (tentative)

2022

Multimedia Security and Privacy

Digital watermarking

1. Explain the difference in the usage of and requirements to digital robust watermarking, steganography and tamper proofing. Cours (3)
2. Explain the difference between the watermarking and data hiding. Explain when each technology can be used. Explain the block diagrams and the difference between the decoding and detection problems.
3. Explain the watermark detection problem. Explain the difference between the Neyman-Pearson and Bayesian hypothesis testing. Explain the different types of errors.
4. Explain which parameters of image and watermark influence the distributions of sufficient statistics under different hypothesis and error probabilities.
5. Explain the main classes of attacks against robust watermarking.
6. Explain the geometrical synchronization problem in the digital watermarking.
7. Explain the difference between the additive and quantization embedding/modulation.
8. Explain digital watermarking in the transform domain. What are the main advantages?

Content fingerprinting

1. Explain the main differences between content fingerprinting (robust perceptual hashing) and cryptographic hashing. Cours (3)
2. Explain the usage of content fingerprinting in various applications. What are the main advantages? Cours (3)
3. Explain the construction of content fingerprinting function based on random projections and binarization. Cours (3) ?
4. Explain the statistics of coefficients under random projections used in content fingerprinting. Properties. Cours (3) ?
5. Explain the difference between the sufficient statistics in digital watermarking (linear cross-correlation) and Hamming distance? What are the implications of these differences?

Cours (3) ?