1. RGB &YUV (4:2:0, 4:2:2, 4:1:1, 4:4:4) representation of images
2. Quantitative image quality: PSNR & MS-SSIM
3. Entropy (in lossless compression)
4. Run-length Coding
5. Huffman Coding
6. Arithmetic Coding
7. Linear Quantization1 (what is Linear Quantization)
8. Non-linear Quantization (what is Non-linear Quantization)
9. Predictive Coding
10. 1-D general Transform
11. 1-D and 2-D DCT
12. Machine Learning: cross-entropy loss and least square loss
13. Machine Learning: Soft-Margin loss (Support Vector Machine)
14. Machine Learning: Gradient descent
15. Convolution
16. CNN (forward only)
17. RNN (forward only)
18. Back-Propagation
19. How to Code CNN with pytorch
20. How to Code CNN with Matlab
21. How to Code CNN with X (not Matlab or pytorch)
22. CNN for denoising
23. CNN for video compression
24. Motion Compensation (Pipeline)
25. block matching Algorithm
26. JPEG
27. H261
28. H262, MPEG-2 Part 2
29. Interlaced scan and Frame/field representation in video coding standards
30. H264 MPEG-4
31. H265 HEVC