

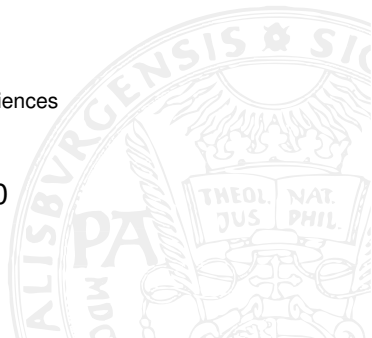
Slides Media Data Formats

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Questions for Lecture Notes Section 2.1.3 - 2.1.5

- 1 Under which circumstances may runlength encoding lead to data expansion ? What is the consequence ?
- 2 Which formal condition needs to be fulfilled in variable length coding concerning the length of a codeword to attain the entropy bound ?
- 3 Why does this strategy necessarily lead to suboptimal compression ratio ?
- 4 What is the importance of a prefix code ?
- 5 There is an error in the example prefix code given for the left-side tree in the figure. Which one ?
- 6 Explain the code generation in Shannon-Fano coding.
- 7 How can Huffman coding be improved from looking at single symbols ? What is the downside of doing so ?
- 8 Explain the code generation in Huffman Coding.

Questions for Lecture Notes Section 2.1.5 - 2.1.6

- 9 What is modified Huffman coding ? When is it applied ?
- 10 Why is Huffman coding suboptimal in case we have a symbol with very high probability of occurrence ? When thinking about differential coding, which symbol might be affected ?
- 11 What needs to be done in case of changing source statistics to avoid data expansion ? Why can the latter happen at all ?
- 12 Describe the two ways how to adapt to changing source statistics in VLC (besides ignoring those) !
- 13 In which media standards do we apply Huffman coding ? How can we avoid using it in adaptive manner ?
- 14 What is the intuitive reason for the suboptimality of Huffman coding and how does AC resolve that ?
- 15 What is the principal approach how to encode a symbol sequence in AC (what is actually encoded) ?

Questions for Lecture Notes Section 2.1.6

- 15 Describe the way the Elias code constructs intervals in AC.
- 16 What are the most important properties of these intervals ?
- 17 How do we represent / encode an interval in AC (in the Elias code and in general) ?
- 18 Why can we encode longer intervals with less bits than shorter ones ?
- 19 Why is re-normalisation applied in actual AC implementations ?
- 20 How is adaptivity to changing source statistics being implemented in AC ?
- 21 In AC, we can immediately output the first bits after decoding the first bits of the interval. How does this work ?
- 22 In which media data formats do we see AC being applied ?

Questions for Lecture Notes Section 2.1.7

- 23 In how far can dictionary compression be seen as a compromise between VLC and AC ?
- 24 What is the trade-off between the sizes of history buffer and lookahead buffer in LZ77 ?
- 25 Is LZ77 suited to compress many small files ? Explain your answer !
- 26 Why is LZ77 an asymmetric compression algorithm ?
- 27 How can we exploit long-term redundancy in LZ77 ?
- 28 What is the start-up phase in LZW ?
- 29 Explain the concept of “phrasing” (consider the example in Table 4.3 !)
- 30 List and explain the critical algorithmical issues in LZW !
- 31 In which media data formats is dictionary compression applied ?

