Video Coding

Seminar 3

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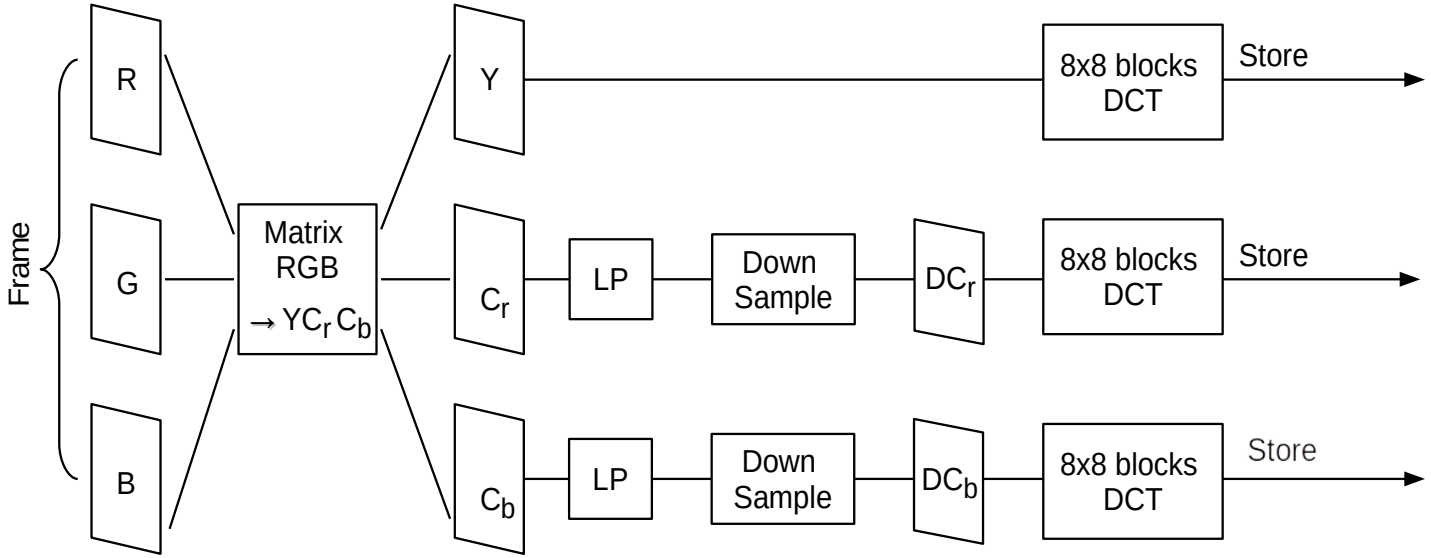
Homework assignment

- Use the video encoder and decoder framework from **Homework 2**
- Apply LP-filter and then 4:2:0 **Downsampling with removing of zeros**.
- Apply DCT-2.
- Decide how many DCT components to keep and how many put to zero (see Lecture 4 as example, where ¾ of the highest frequencies were set to zero)
  - Introduce a quality factor which indicates how many coefficients per block you keep (for instance how many of the low frequency components in each direction)
  - This quality factor should be the same for all components and on the encoder and decoder side
- Try different factors

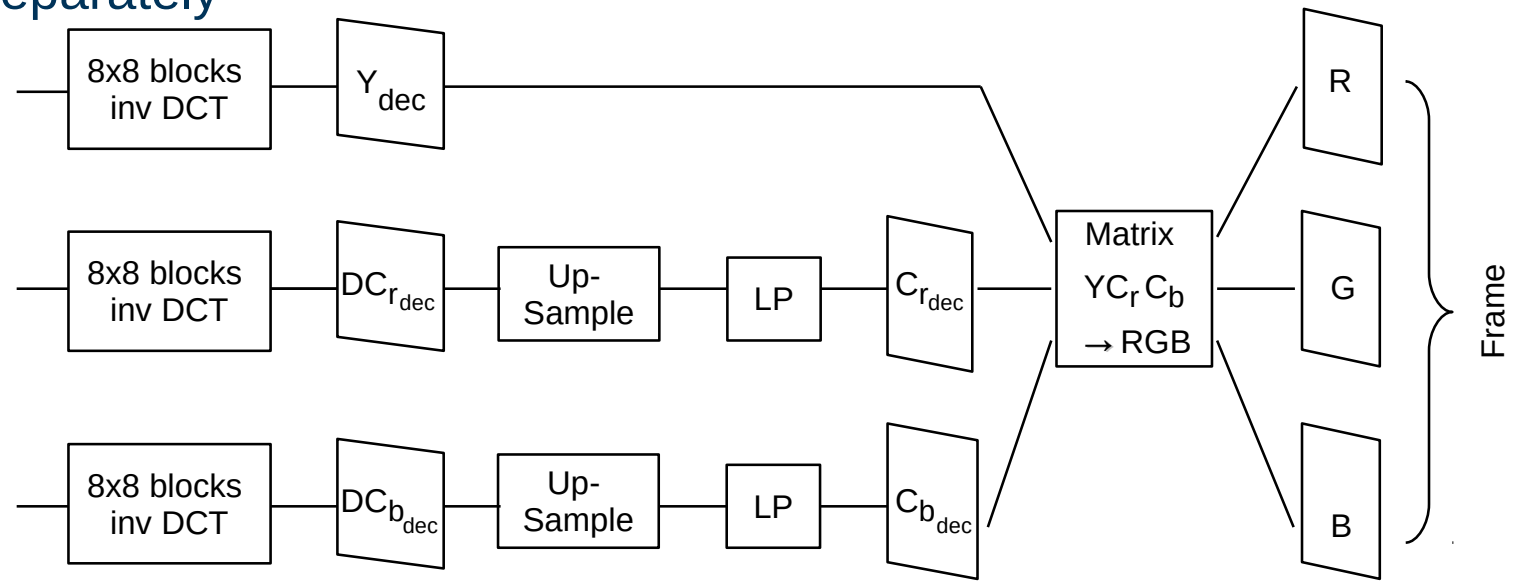
Homework assignment

- **Encoder side:**
  - Apply DCT-2 to each 8x8 blocks of Y, Cb, Cr components separately
  - Store only non-zero components in a matrix
  - Display the intermediate result



Homework assignment

- **Decoder side:**
  - Fill in the matrix with zeros to restore the original size
  - Apply inverse DCT-2 of 8x8 blocks to Y, Cb, Cr components separately



Homework assignment

- **Decoder side:**
  - Follow the reverse procedure as on the encoder side
  - Display the reconstructed image (RGB)
  - How does the perceptual quality change, if you change the quality factor?
  - What is the compression ratio you can achieve with different quality factors?

Homework presentation

- Imshow Cb and Cr components after downsampling and removing of zeros
- Imshow reconstructed RGB image
- Encoder and Decoder – 2 different python files