

Multimedia

Assignment 3

Video Media Type

In this assignment, we want to investigate the effect of Cosine transform in data compression.

Use the sample images provided with the assignment (frame1 and frame2) .

Open frame2 using MATLAB or Python. Choose different random areas of size 16 x 16 in frame2.

Hint: Gray scale image have only one component. The image may include three components with repeated data. In that case consider only one component.

- 1- Find the most similar area to the selected block in frame1 (Motion estimation). Use SAD to compare different regions and scan the whole image (frame1).
- 2- Find the difference of the selected block with the most similar area in frame1
- 3- Use DCT to find the discrete cosine transform coefficients of the difference.
- 4- Round the coefficients to their nearest integer.
- 5- Use DCT to find the discrete cosine transform coefficients of the selected area.
- 6- Round the coefficients to their nearest integer.
- 7- Compare the coefficients in both cases and elaborate on the results
- 8- Repeat steps 1-7 on a few areas.

Deliverable

Report the result of all steps. Discuss your results. Include your code for each step.

The most important points to consider are:

- 1- The motion estimation/compensation step. (What is its impact in terms of time, compression rate, etc.)
- 2- Cosine Transform impact on compressing and representing the data with a few coefficients