Exercise Multimedia Technology WS 2004/2005

Sheet 3 (November 12th 2004)

3.1 Single image compression

Let's consider two types of images, one being taken from the real world ("Fotos"), the other being computer generated like e. g., cliparts.

- Discuss the compression methods JPEG and GIF with regard to their usefulness for the two types of images. How could preprocessing the image improve the compression ratio?
- How does JPEG work? What kinds of images are especially suitable for JPEG compression? How is it possible to improve the compression ratio, in this case by applying preprocessing?

3.2 Block truncation coding

A tiny image is defined by the following table.

92	108
106	94

Code the image using the block truncation coding (BTC) algorithm.

3.3 Animation

We have learned in the lecture how articulated structures can help the animator to create realistic motions of a skeleton. The idea is to limit the degrees of freedom in order to allow only valid motion. Even more realism could be achieved by modelling motion according to the laws of physics.

Simulate the motion of a jumping ball yourself. The user should be able to place the ball initially somewhere on the screen. At the beginning it should be assigned an initial random motion. It should then fall to the ground and bounce back.

Hint: The motion (vector) of the ball consists of a vertical and a horizontal component. In each time unit gravity “pulls” on the vertical component. The horizontal component is never influenced. The motion vector is used to update the location of the ball between two frames of the animation. After bouncing off the ground some kinetic energy should be lost.