Exercise Sheet Image Processing 2 (18 points)

Submission: 13.05 09:00 in the morning

Exercise 1   Interpolation   (5 Points)

a) Construct for the following 3x4 image a reduced 3x3 image using i) nearest neighbor interpolation with possible intensity values 0,1, ii) bi-linear interpolation with possible intensity values 0,1, and iii) bi-linear interpolation with possible intensity values 0, 0.33, 0.67, 1   (5 Points)

0	1	0
1	1	1
0	1	0
1	1	1

Table 1: Image to Interpolate

Exercise 2   Image Classification   (13 Points)

a) Describe with your own words the 3 elements necessary to predict if an entity belongs to a class.   (6 Points)

b) Given a data set as the one plotted in Fig. , how many separating hyperplanes exist, that correctly separate the two classes? Which is the one selected by the support vector machine and why?   (4 Points)

c) A robot uses an SVM to recognize balls (E.g. Fig. 2). Describe the required steps to extract plausible classification features for a binary problem "ball/not ball".
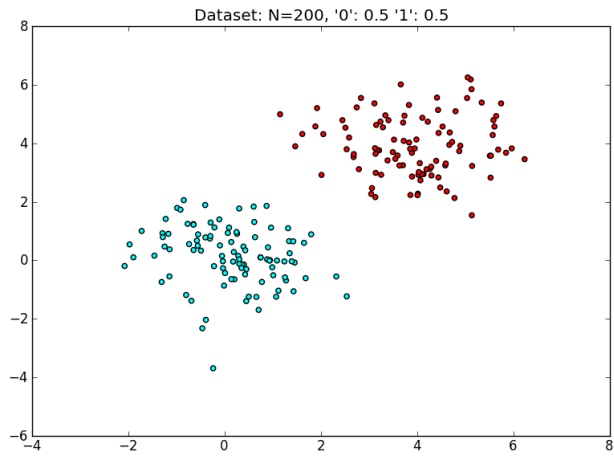
(3 Points)

Figure 1: data set

Figure 2: One Sample