Pattern Recognition practical 1

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1 Assignment 1

1

Consider it done

2

To compute the pair-wise correlation coefficients we used the following command:

Input

```
load('lab1_1.mat')
corrcoef(lab1_1)
```

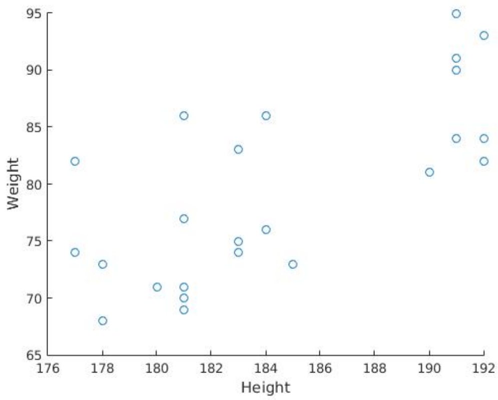
This yields us the following table of correlation coefficients:

Table 1: *Pair-wise correlation coefficients*

	Length	Age	Weight
Length	1	-0.0615	0.7156
Age	-0.615	1	0.5142
Weight	0.7156	0.5142	1

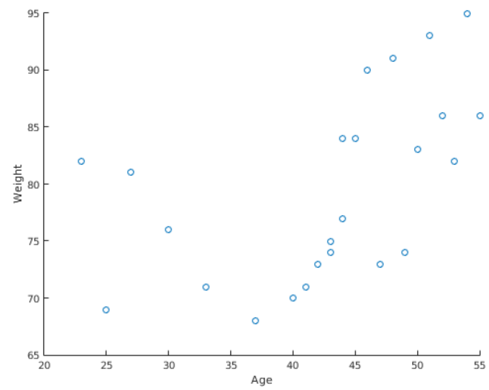
3

The two features for which the correlation is the largest are the first and third column, respectively the height and the weight.



(a) Scatterplot of weight to length

The two features for which the correlation is the second largest are the second and third column, respectively the height and the weight.



(b) Scatterplot of weight to age

Figure 1

From a scatterplot alone it is hard to draw conclusions about any possible relationships between the different features. We do get indications though; figure 1a shows that there is likely to be a correlation between the weight and the height. An increase in weight seems to correspond to a (somewhat linear) increase in height. A similar kind of relationship can be seen in figure 1b, between the factors weight and age.

2 Assignment 2

3 Sets S and D

The following subsections show the code we used to acquire the 1000 Hamming distances for set S and D.

a

Code for set S

```
for i = 1:1000
person = randi([1,20]);
row1 = randi([1,20]);
row2 = row1;
while(row1 == row2)
row2 = randi([1,20]);
end
load(sprintf('person%02d.mat',person));

hd_s(i) = sum(abs(iriscode(row1,:)-iriscode(row2,:)));
end
```

b

Code for set D

```
for i = 1:1000
for i = 1:1000
person1 = randi([1,20]);
row1 = randi([1,20]);
row2 = randi([1,20]);
person2 = person1;
while(person1 == person2)
person2 = randi([1,20]);
end
load(sprintf('person%02d.mat',person1));
x = iriscode(row1,:);
load(sprintf('person%02d.mat',person2));
y = iriscode(row2,:);
hd_d(i) = sum(abs(x-y));
end
```

4 Histogram

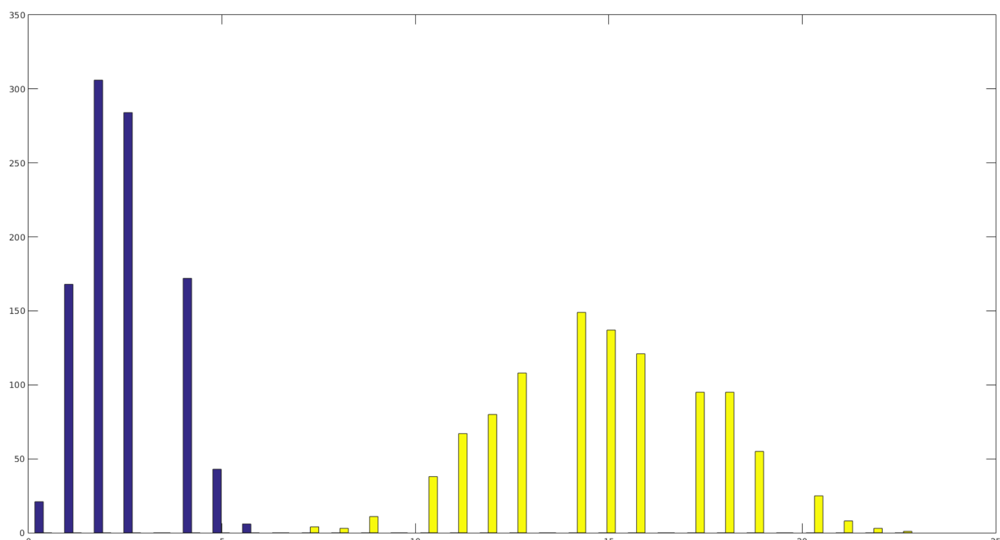


Figure 2: Dus..

Figure 2 shows the histogram of sets S and D.

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3 Assignment 3

1 Background

The topic of biometric identification has been receiving a lot of attention lately. The use of fingerprints, facial features, and iris recognition are considered appropriate for identification. Of these three, fingerprints and iris recognition are considered to be more accurate than facial features, while facial featuresare more flexible, e.g. for the use in surveillance scenarios. A possible improvement for the performance of facial feature identification is the combination of information from multiple sources, for instance the ear. Ear images can be obtained in a similar maner to face images, and a recent study suggests that they are comparable in recognition power[1], and a combination of the sources gives a significant improvement over their individual performance.

2 Method

3 Achieved Results

4 Conclusion

References

[1] Kyong Chang, Kevin W Bowyer, Sudeep Sarkar, and Barnabas Victor. Comparison and combination of ear and face images in appearance-based biometrics. *Pattern Analysis and Machine Intelligence, IEEE Transactions on*, 25(9):1160–1165, 2003.