Laboratory 2 - Binary Classification for fingerprint spoofing detection

Exploit all the data

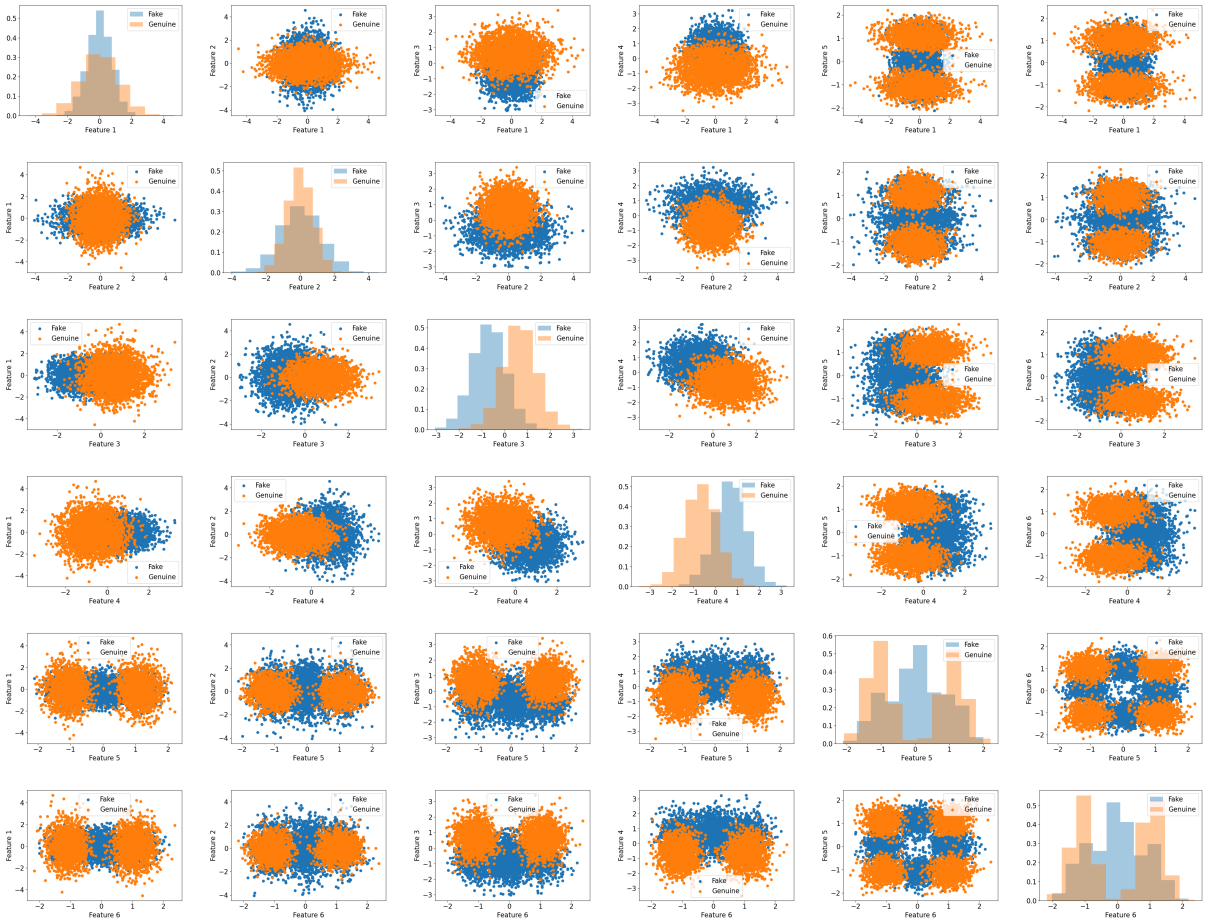

Figure 1: All features

$$\begin{pmatrix} 0.00170711 \\ 0.00503903 \\ -0.00560753 \\ 0.00109537 \\ -0.00700025 \\ 0.00910515 \end{pmatrix}$$

Figure 2: Mean matrix

First question

Analyze the first two features. What do you observe? Do the classes overlap? If so, where? Do the classes show similar mean for the first two features? Are the variances similar for the two classes? How many modes are evident from the histograms (i.e., how many “peaks” can be observed)?

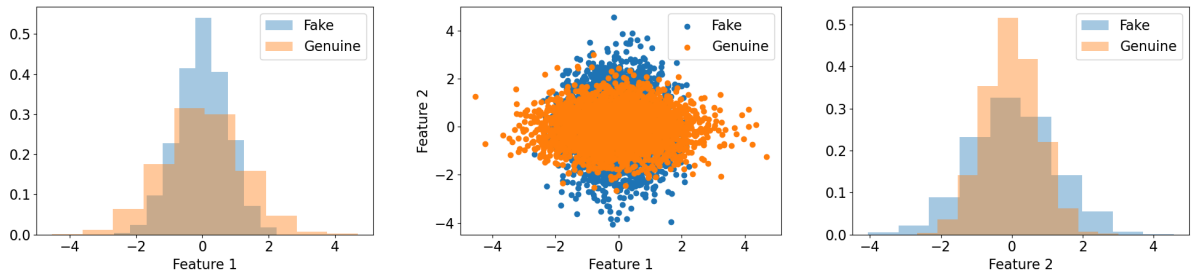

Figure 3: Analyse Feature 1 and Feature 2

Second question

Analyze the third and fourth features. What do you observe? Do the classes overlap? If so, where? Do the classes show similar mean for these two features? Are the variances similar for the two classes? How many modes are evident from the histograms?

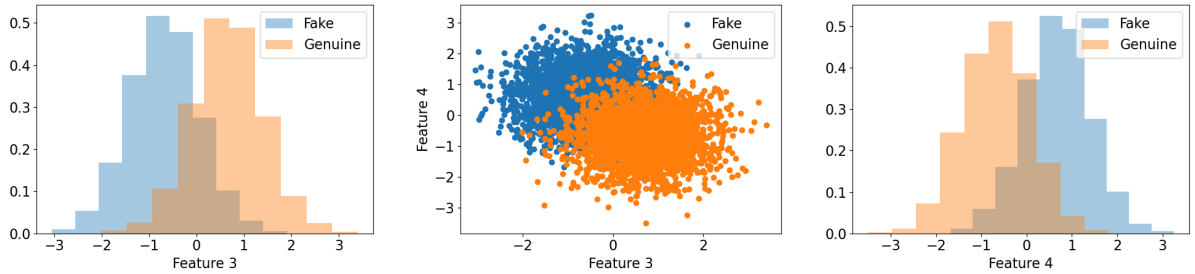

Figure 4: Analyse Feature 3 and Feature 4

Third question

Analyze the last two features. What do you observe? Do the classes overlap? If so, where? How many modes are evident from the histograms? How many clusters can you notice from the scatter plots for each class?

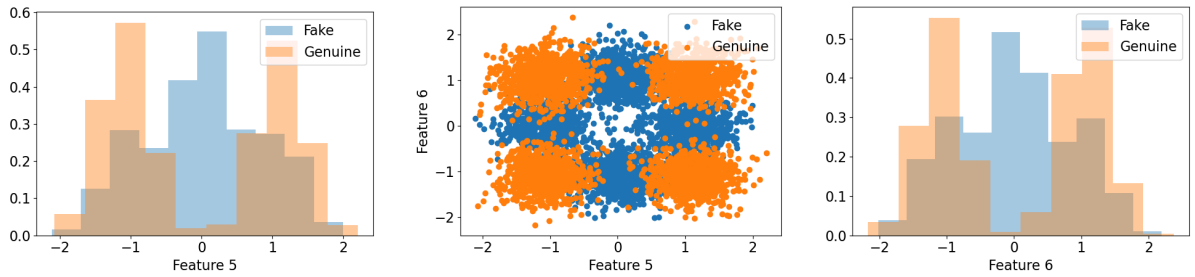

Figure 5: Analyse Feature 5 and Feature 6