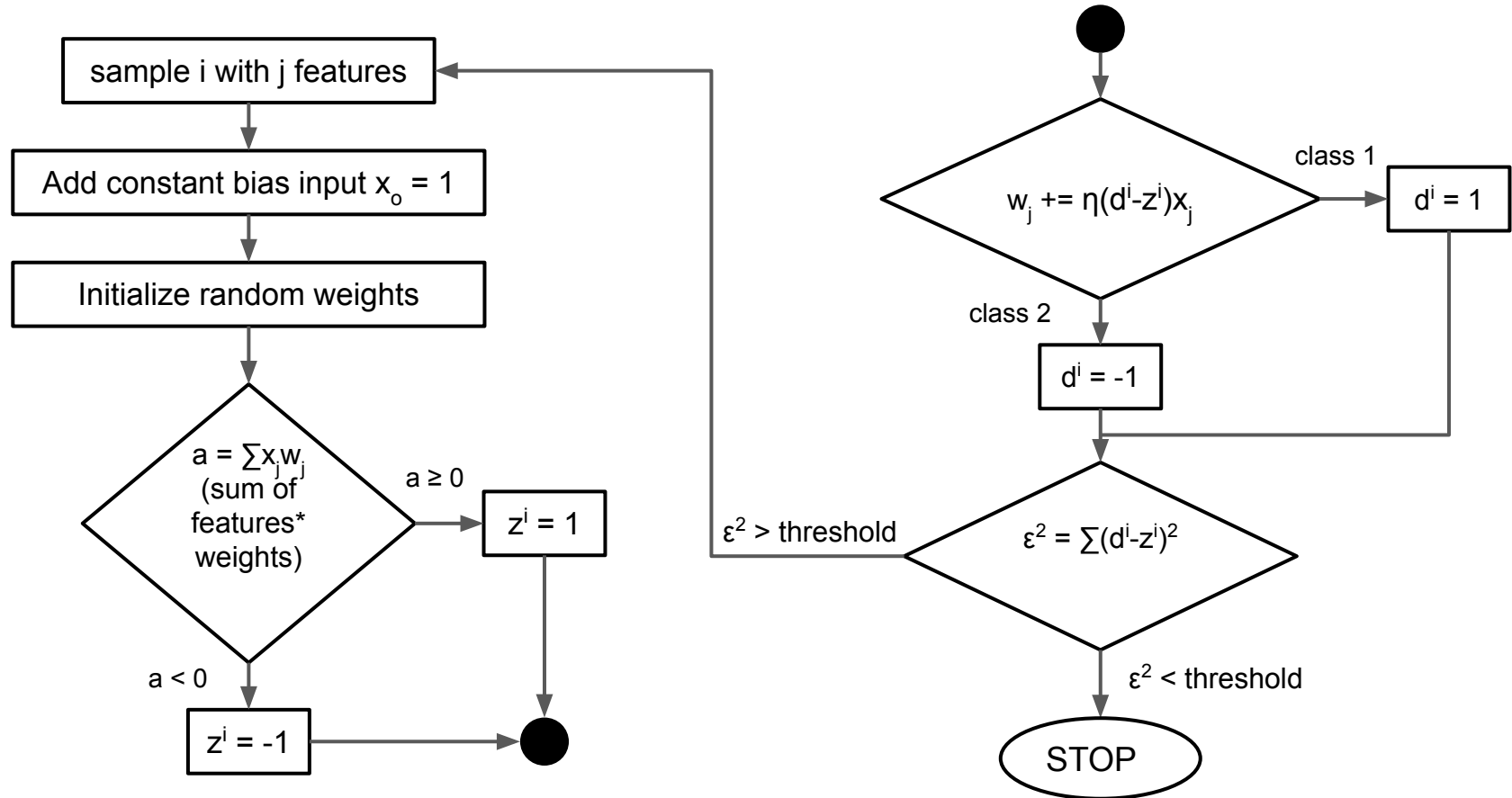


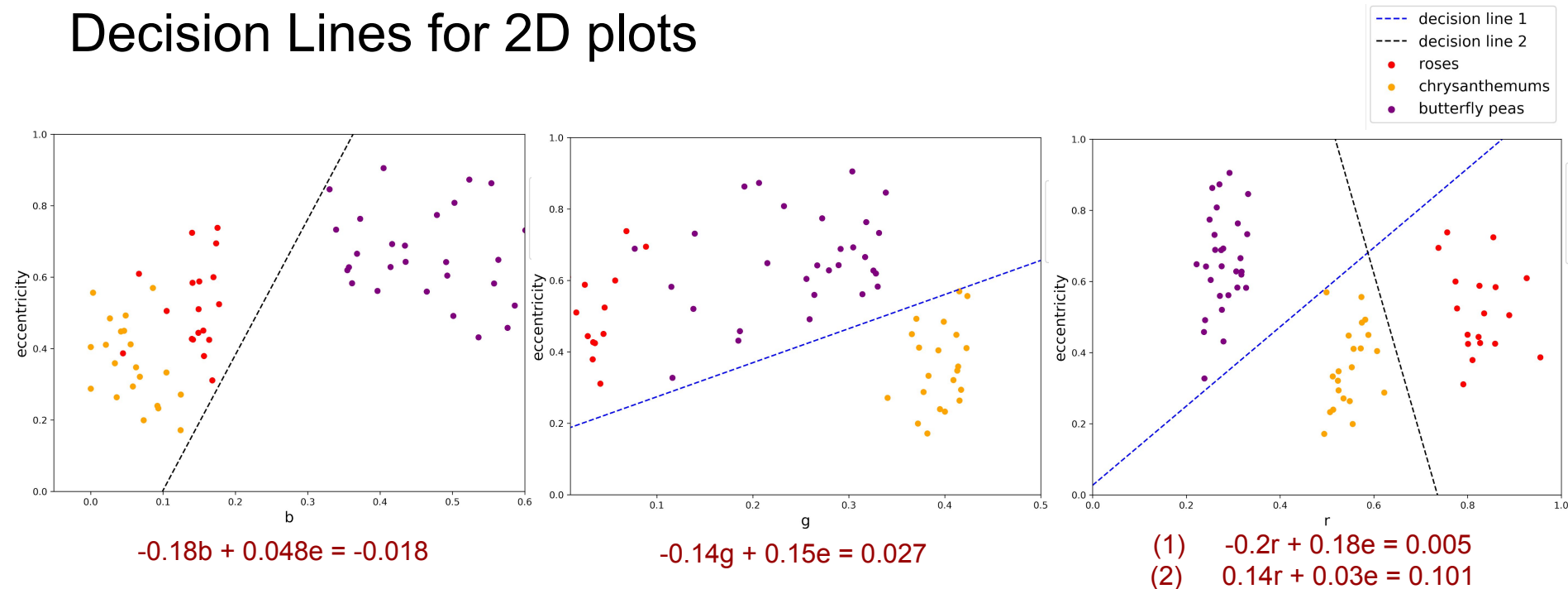
# Activity 13 - Perceptron

de Castro, Crizzia Mielle | 2015-08076

# Perceptron Algorithm

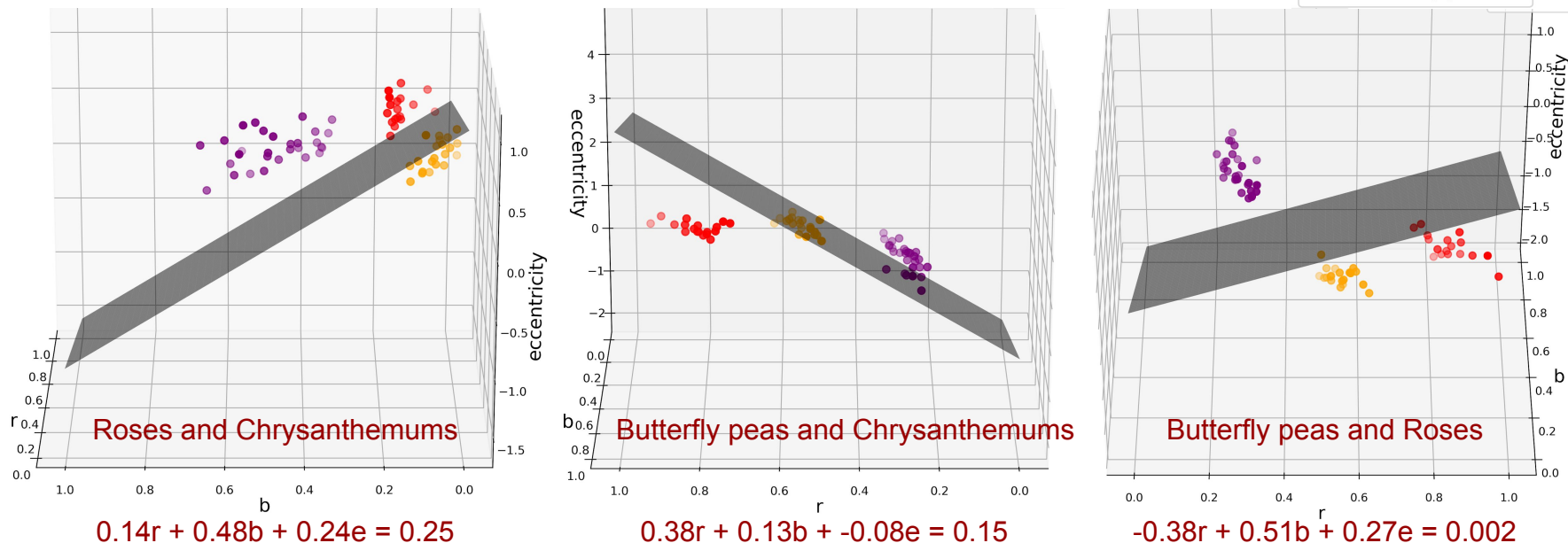


# Decision Lines for 2D plots



I set the learning rate  $\eta$  and the error threshold as 0.01. The Perceptron Algorithm assumes that the separation of two classes must be linear. Thus, I couldn't use it to separate roses from chrysanthemums in the 1st plot, and roses from butterfly peas in the 2nd plot. There is a distinct separation among the three classes in the third plot, so I was able to obtain two decision lines. I first applied the algorithm to butterfly peas and chrysanthemums, then chrysanthemums and roses. The initialized weights are randomized from 0 to 1, so the decision lines I obtain are different for each rerun of the whole algorithm.

# Decision Planes for 3D plots



I also obtained the decision planes for one of my previous 3D plots (r vs b vs eccentricity). I used the standard equation of a plane, and isolated z. I followed the same procedures as the 2D plot, except I used 3 features plus a constant bias, which is equivalent to 4 weights. The final equation of the plane would be

$$z = \frac{-w_0}{w_3} - \frac{w_1}{w_3}x - \frac{w_2}{w_3}y$$