Introduction to Support Vector Machines (SVM)

CS 301

Introduction to Support Vector Machines (SVM)

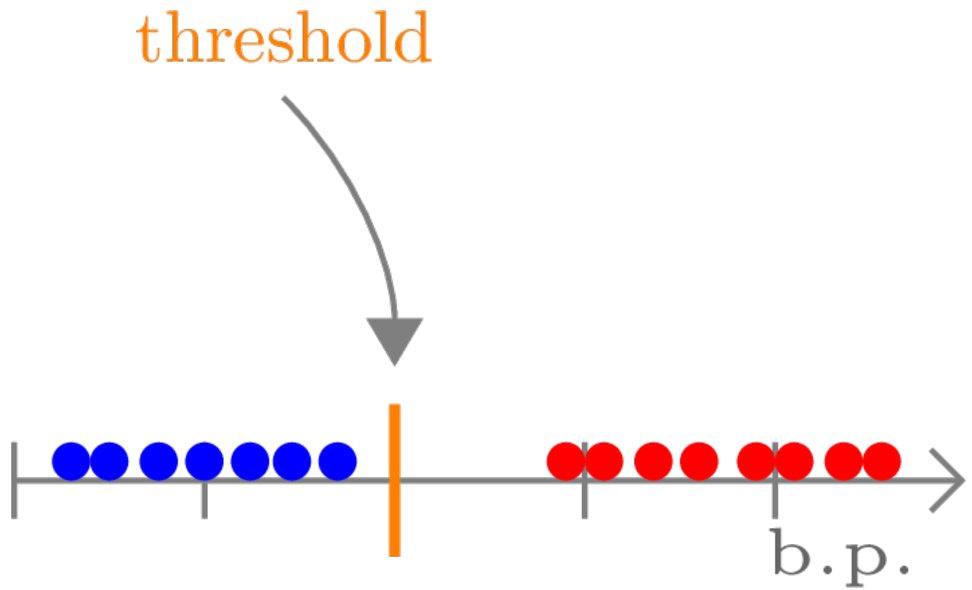
- Support Vector Classifiers
- Support Vector Machines

Support Vector Classifiers

Initial Data Set

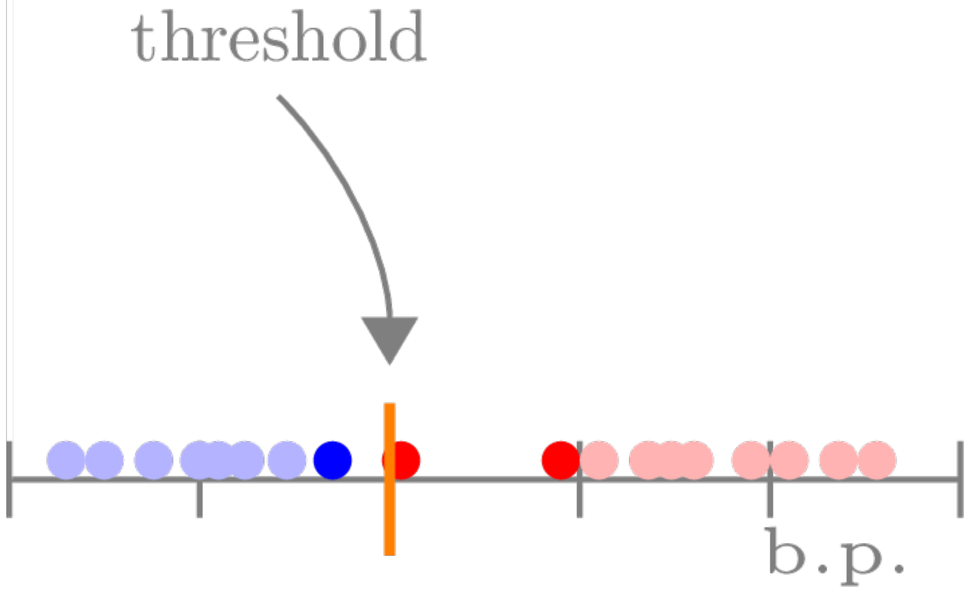
Support Vector Classifiers

Set an Initial Threshold



Support Vector Classifiers

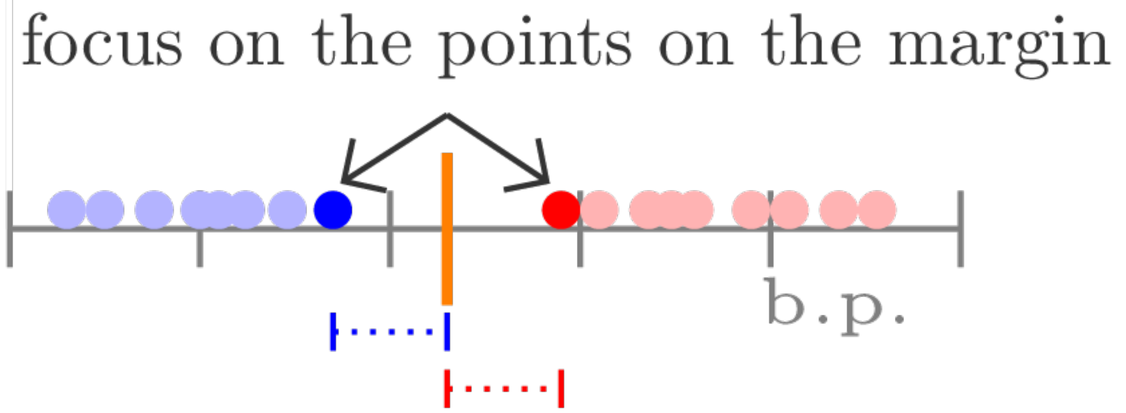
A new observation



Much closer to healthy class than unhealthy class

Support Vector Classifiers

A Maximal Margin Classifier



Support Vector Classifiers

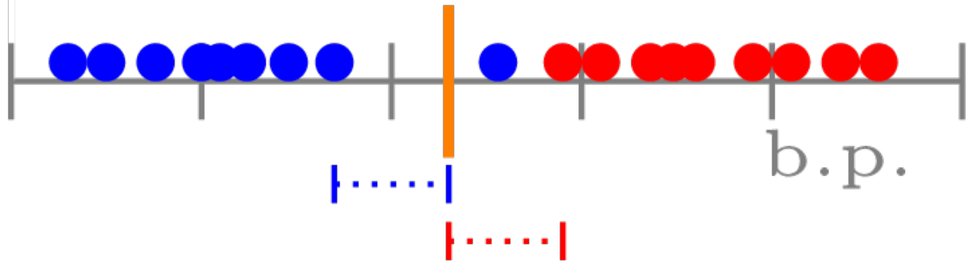
A Maximal Margin Classifier

Too sensitive to outliers!

Support Vector Classifiers

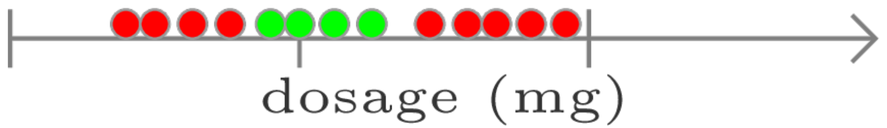
Allow Misclassifications - Creating ‘Soft Margins’

Use cross-validation to find the soft margins that yield the best predictive performance



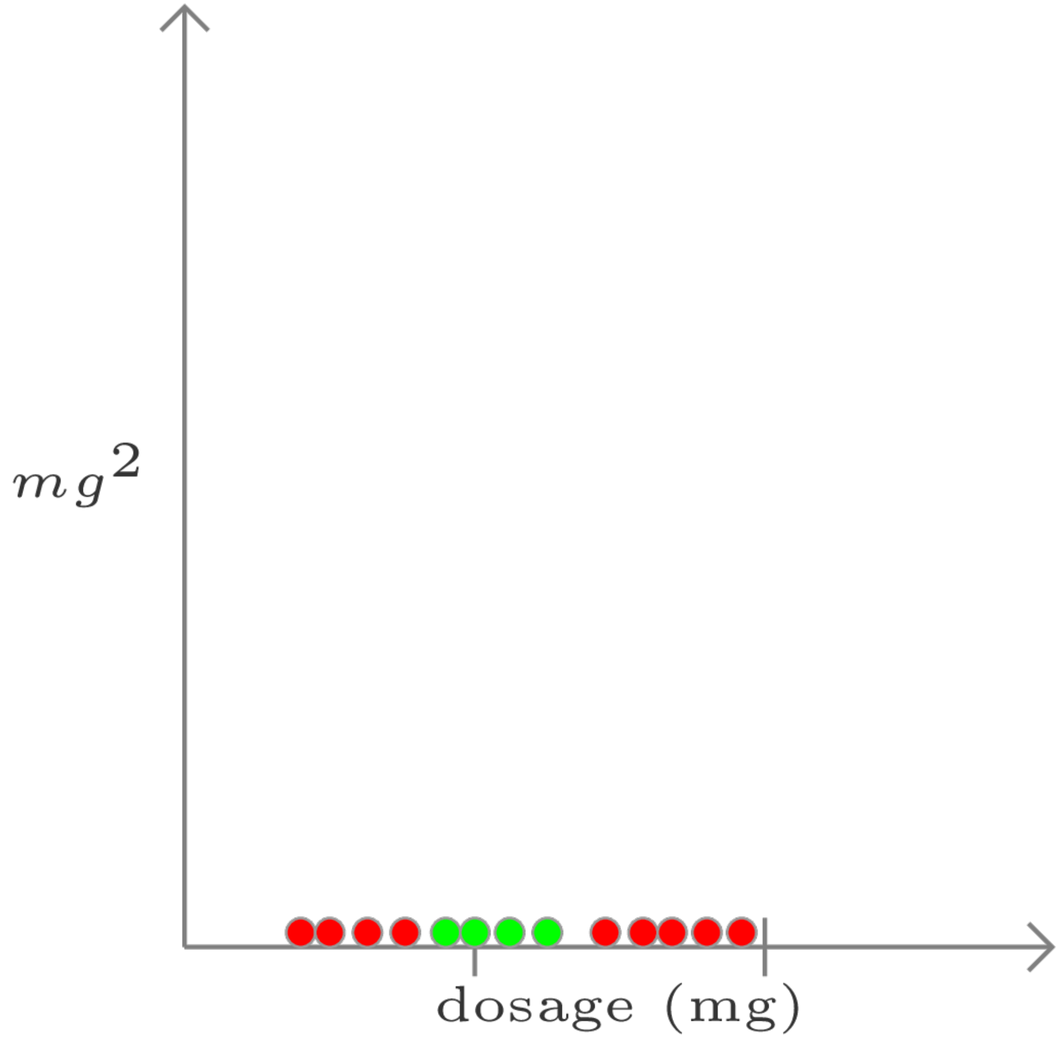
Support Vector Machines

What if our data looks like this?



Support Vector Machines

Let’s apply a transform



Support Vector Machines

1. Start with data in a relatively low dimension.

2. Move the data into a higher dimension.

3. Find a Support Vector Classifier that separates the higher dimensional data into two groups.