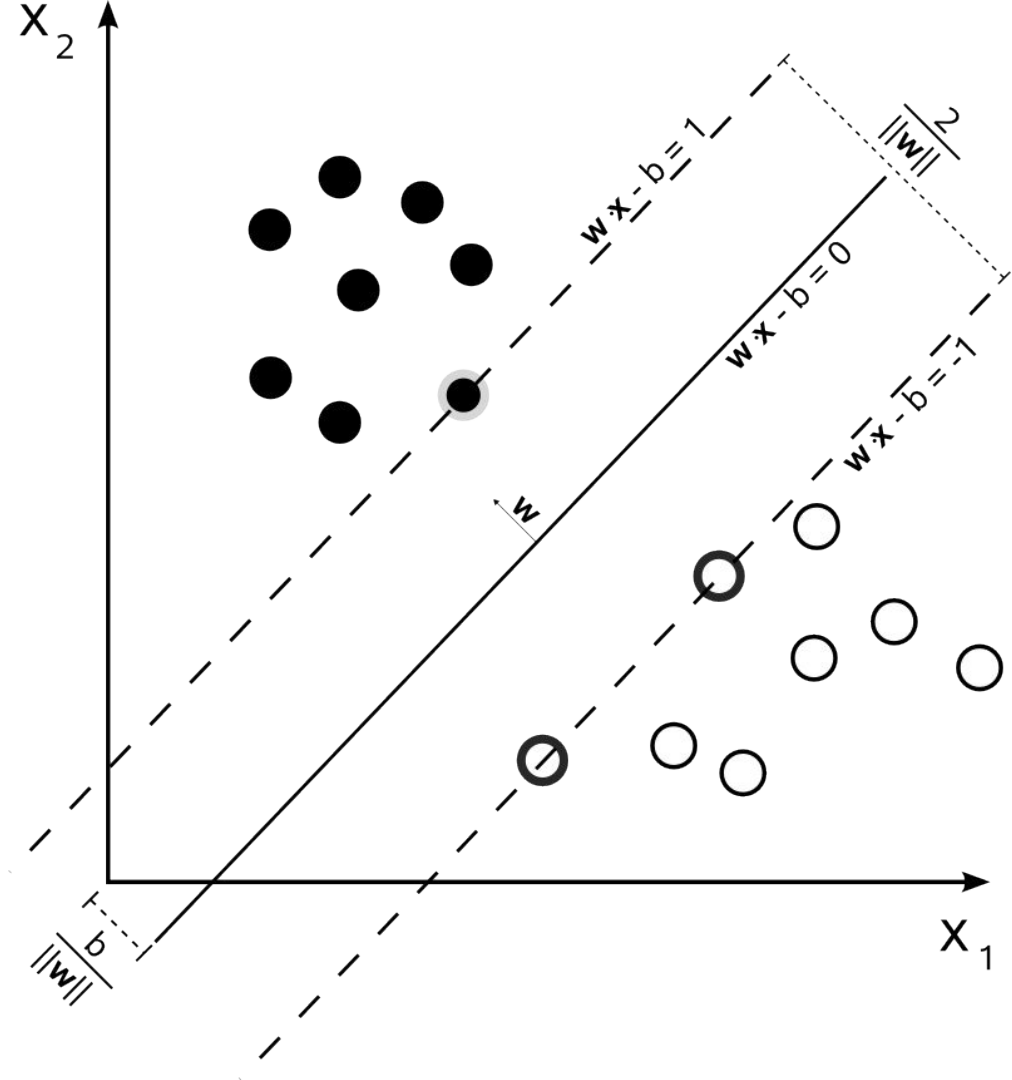


Support Vector Machines

Key Ideas Behind SVM

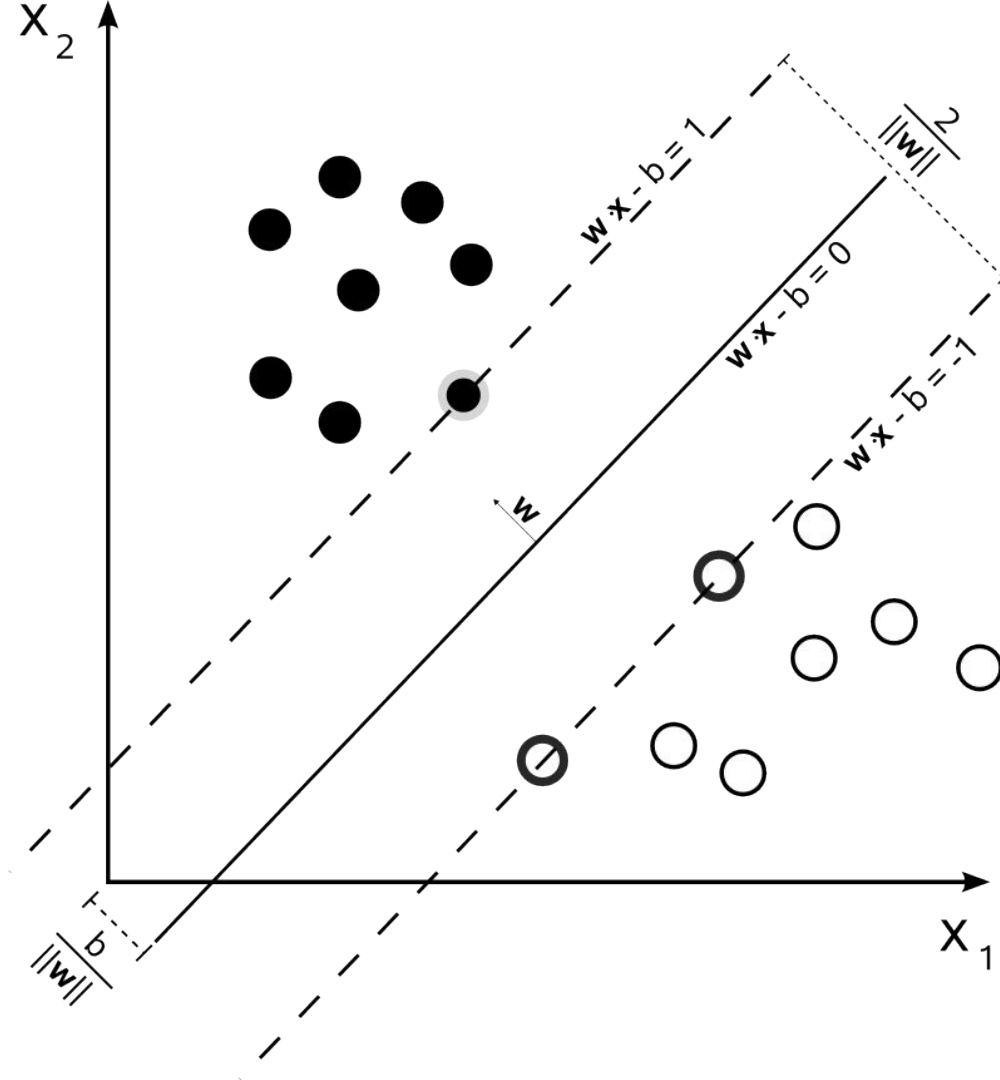
- Maximum margin
- Support Vectors
- Soft Margin
- Kernel Trick

Max Margin:
How to draw the
best line.

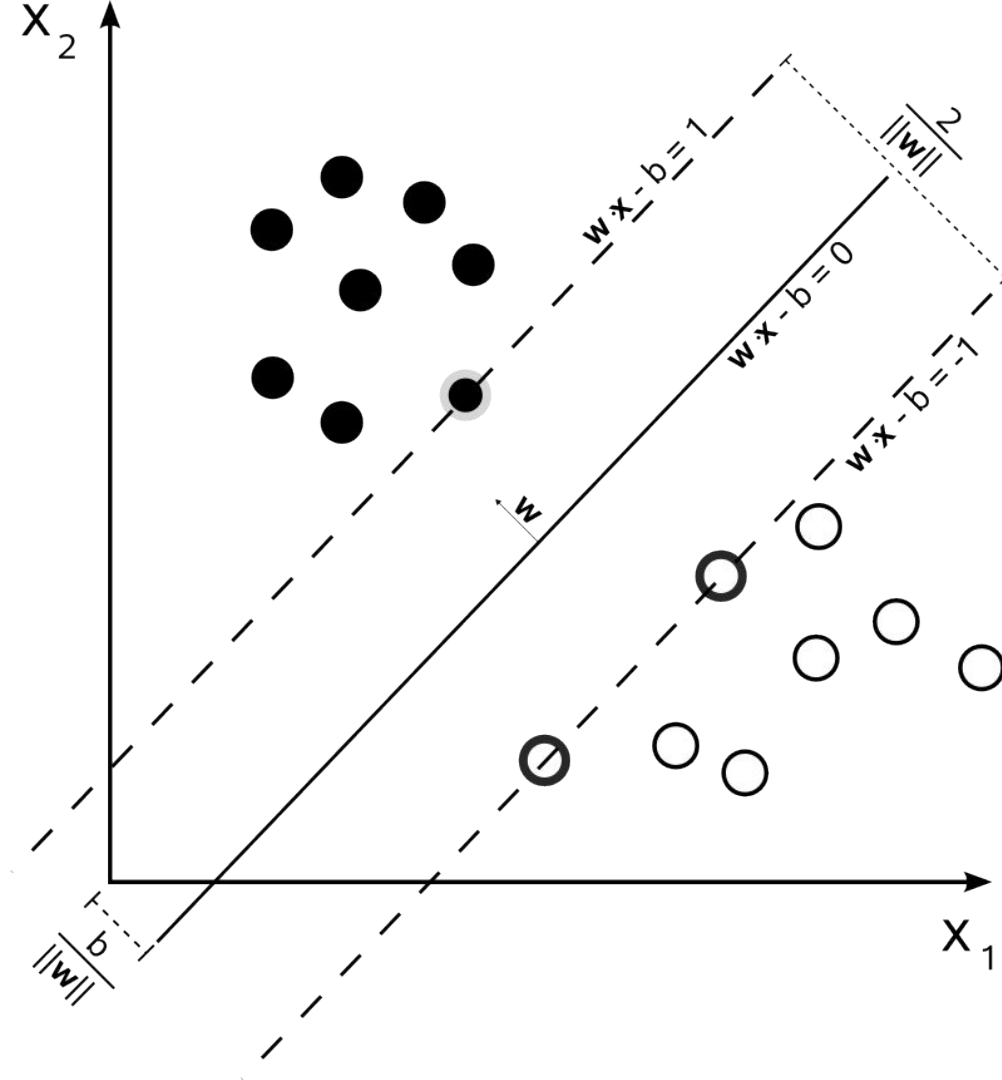


Max Margin:
How to draw the
best line.

SVMs say you
should draw the
line so you
separate the
classes the
most.

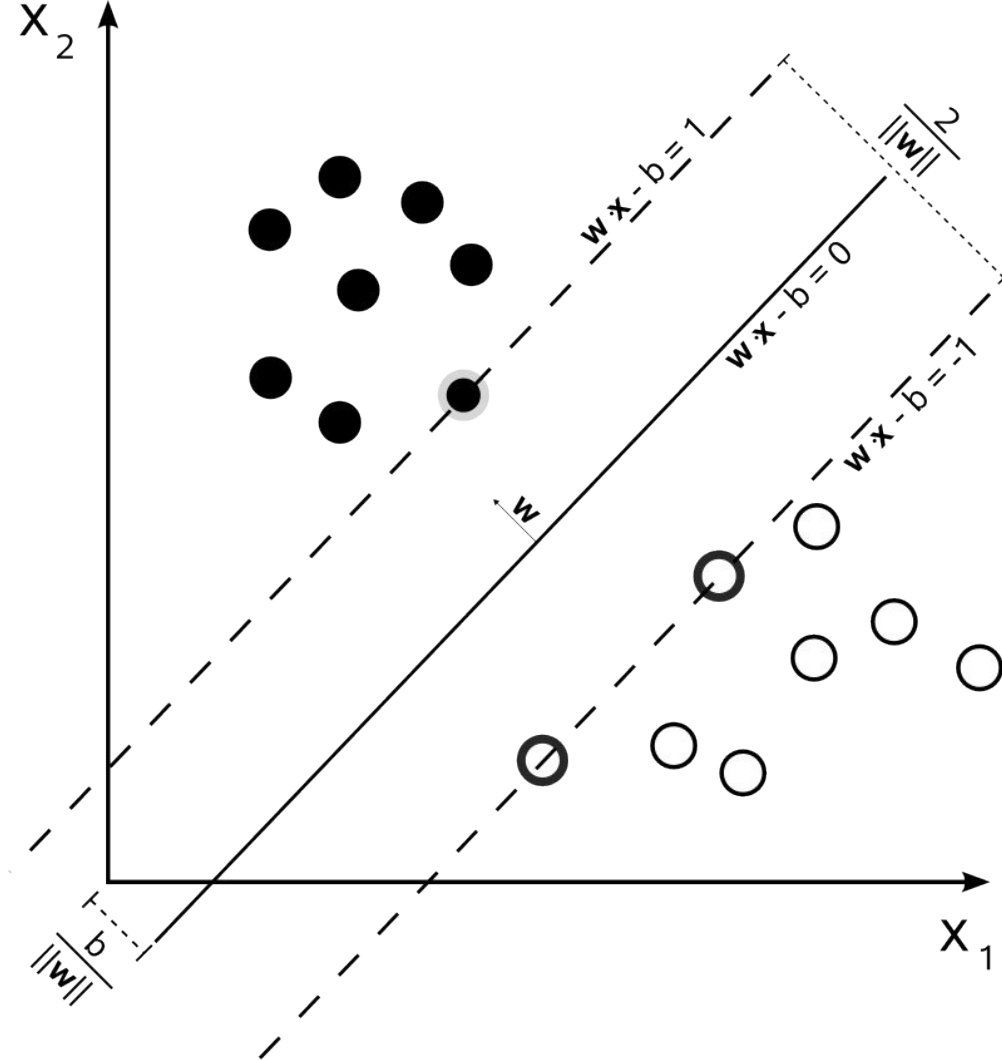


Support Vectors:
Only stuff on the
margin matters

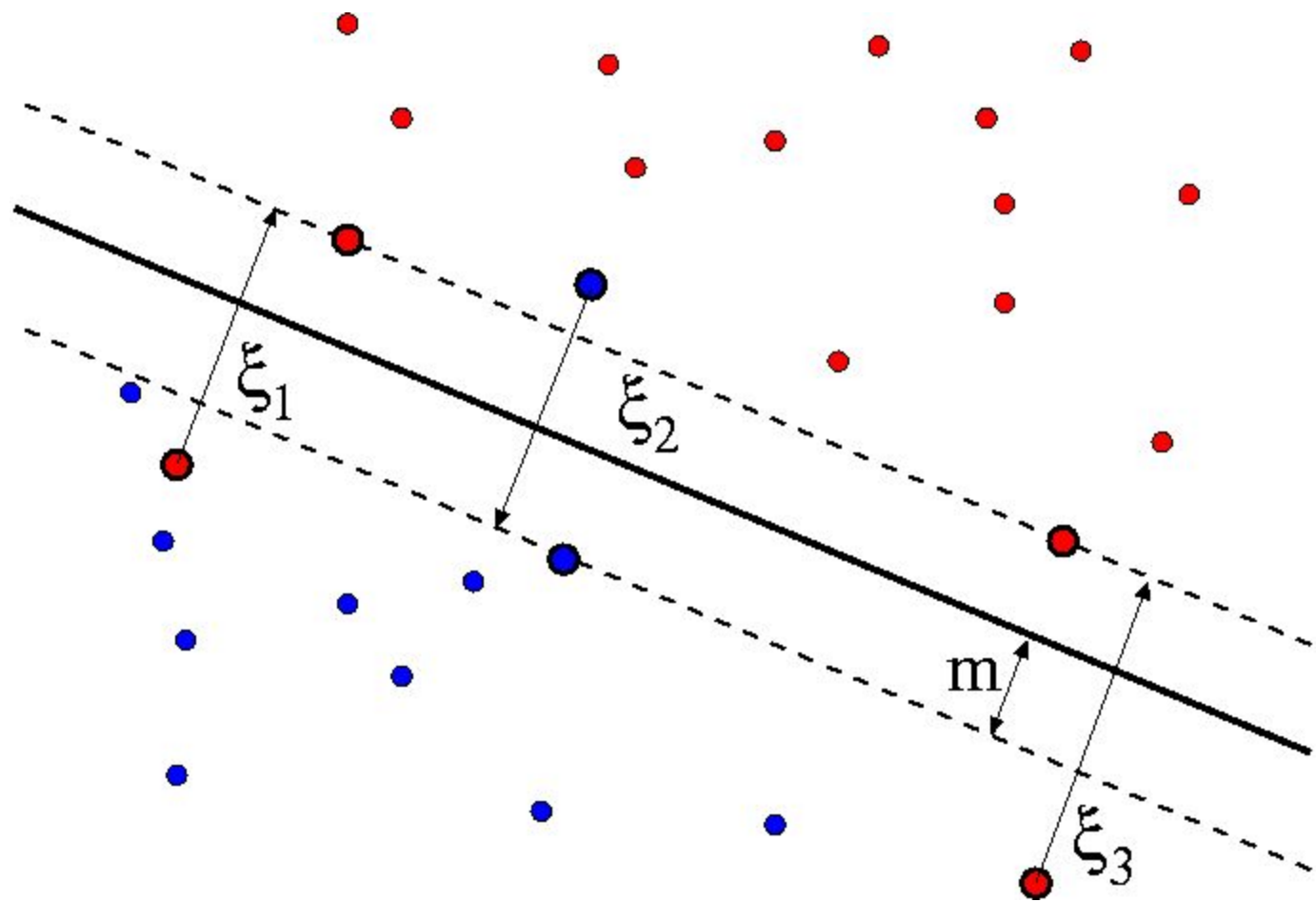


Support Vectors:
Only stuff on the
margin matters

The math of
SVMs shows you
only need to
keep track of
points nearest
the boundary.

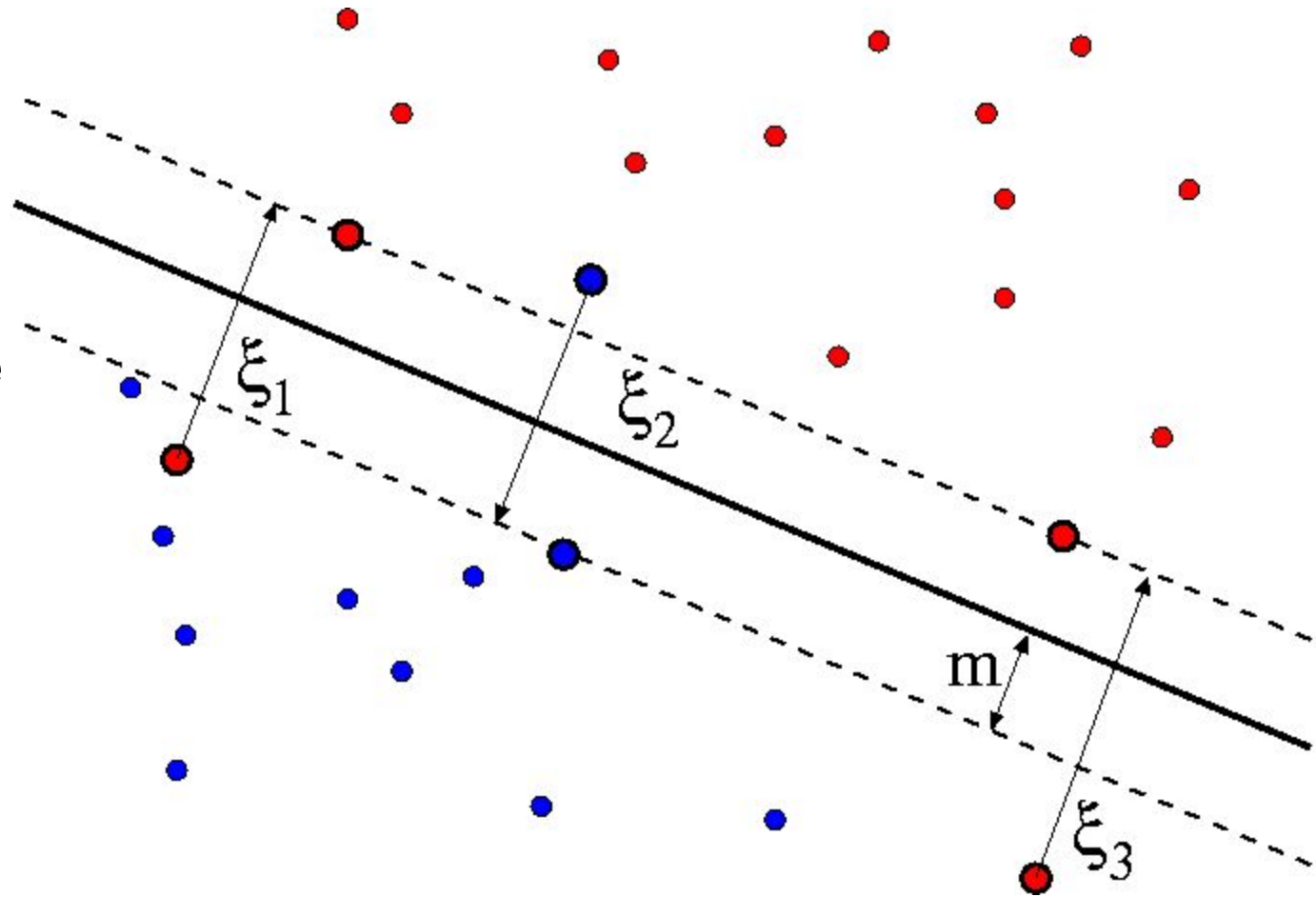


Soft Margin:
Allowing errors

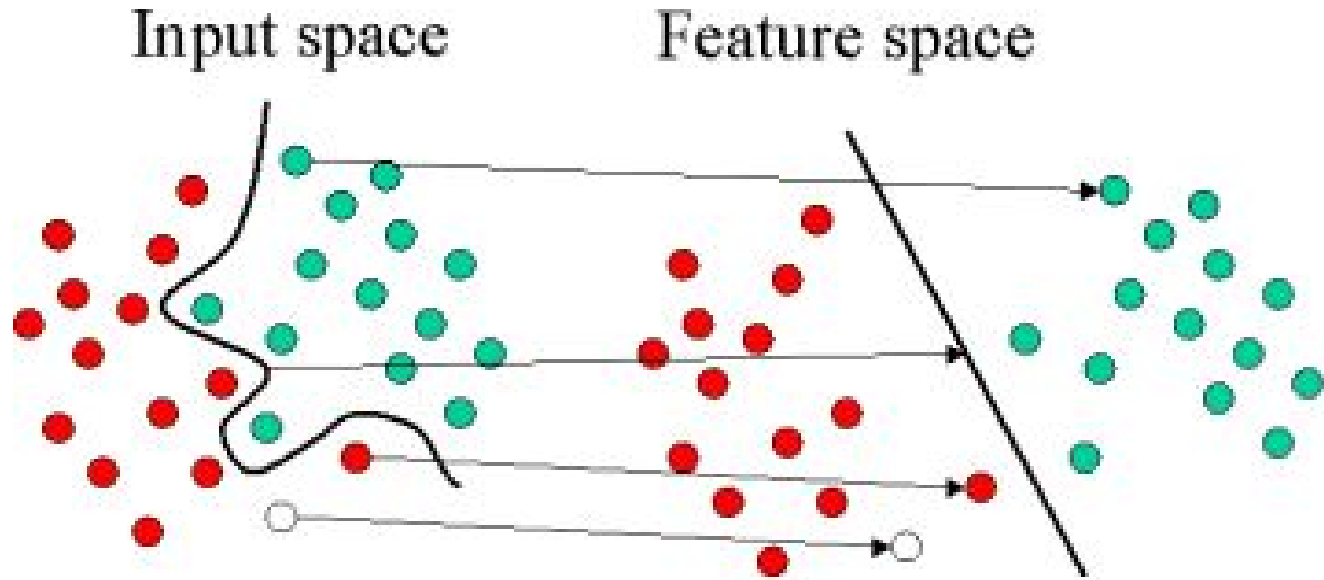


Soft Margin:
Allowing errors

Soft margin allow
you to draw a line
in any situation:
you now care
about the support
vectors, and
those with “slack”

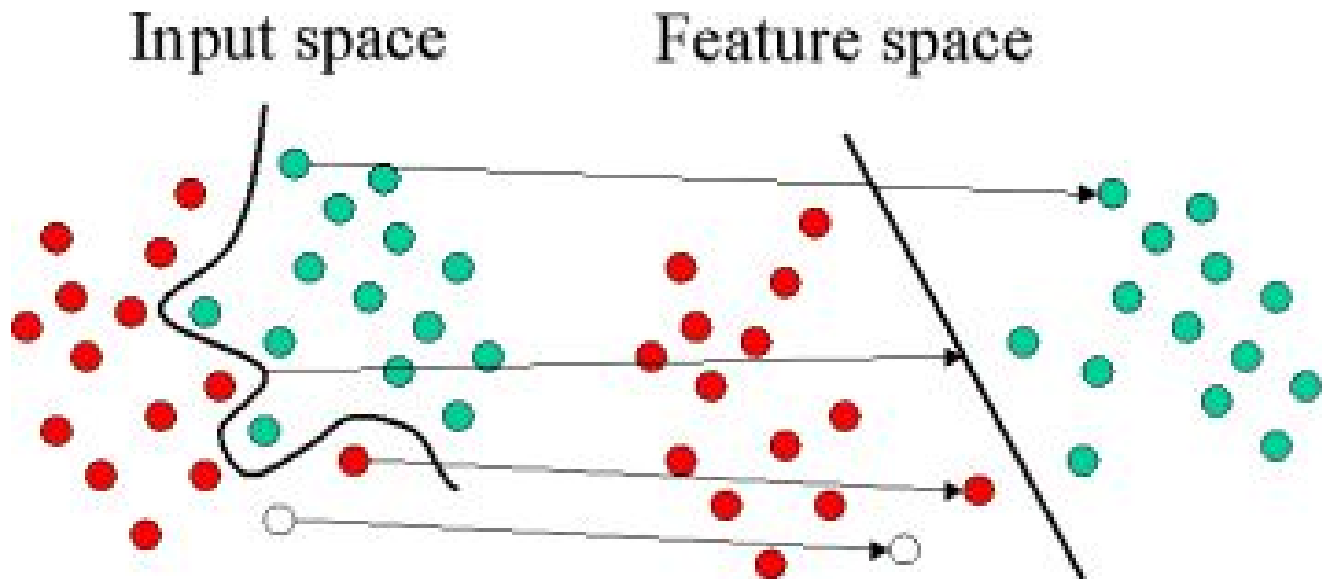


Kernel Trick:
Allowing for
nonlinearity



Kernel Trick: Allowing for nonlinearity

The math of SVMs shows you care about inner products between points. You can replace one inner product with another, and get a new geometry. In the original geometry, this looks like a nonlinear classifier.



Key Ideas Behind SVM

- Maximum margin
- Support Vectors
- Soft Margin
- Kernel Trick