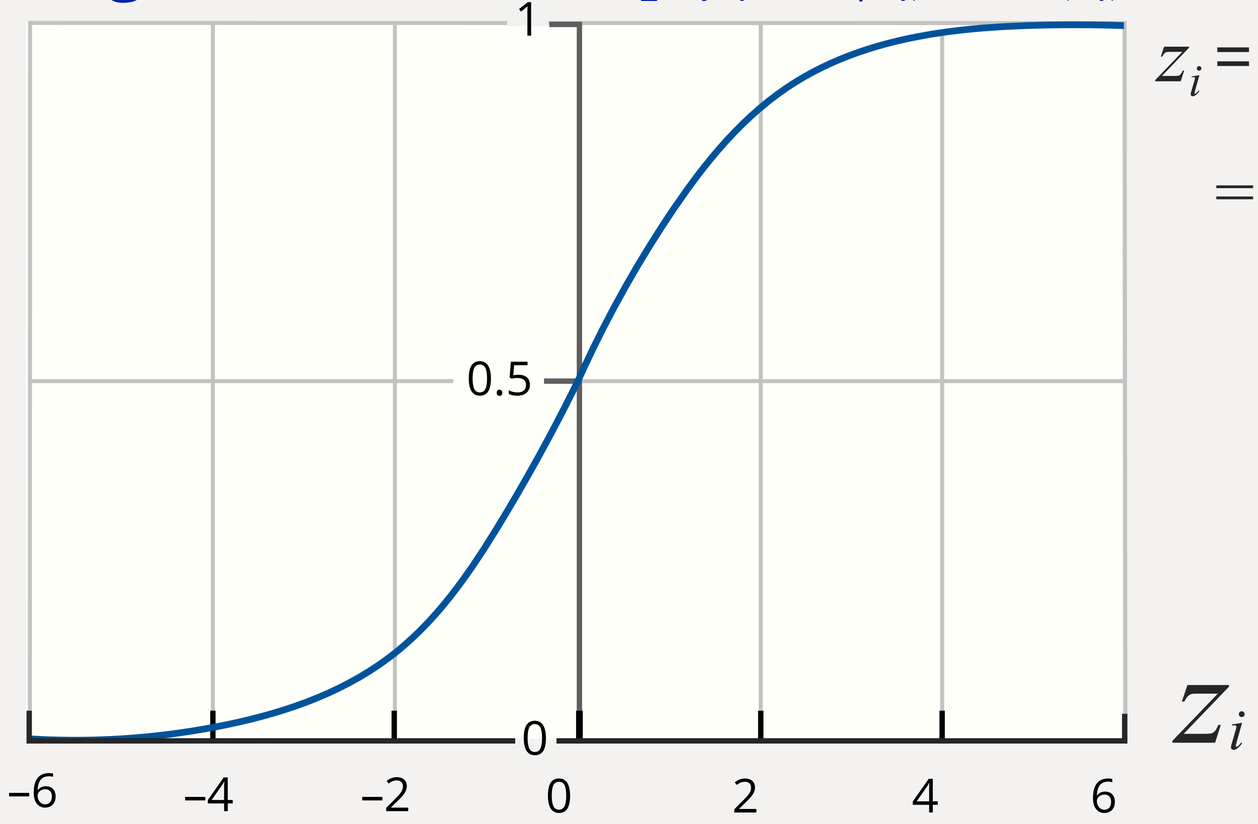
Motivation for Multilayer Perceptron

Logistic Regression

Sigmoid Function $p(y_i = 1|x_i) = \sigma(z_i)$



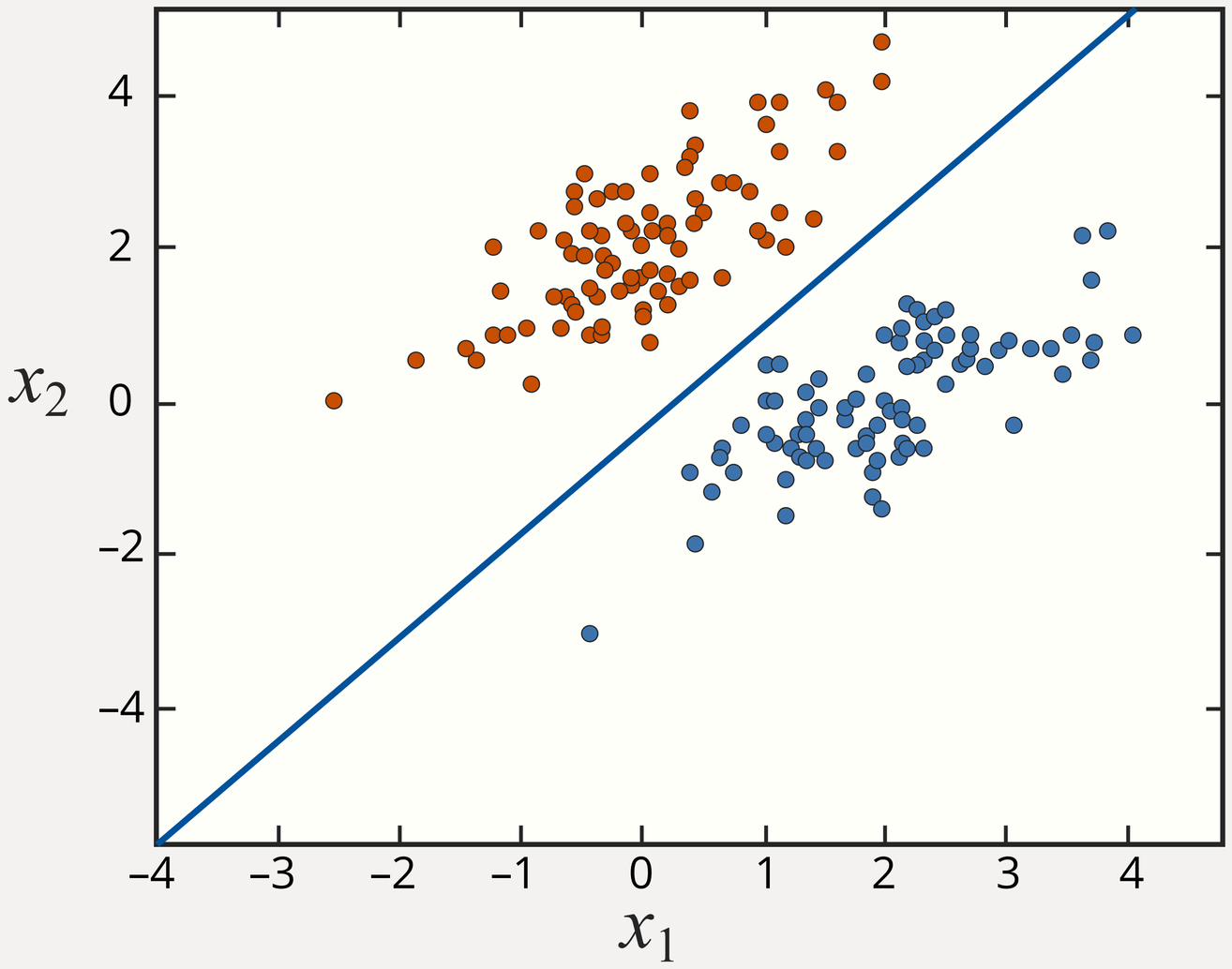
$$z_i = (b_1 \times x_{i1}) + (b_2 \times x_{i2}) + \cdots + (b_M \times x_{iM}) + b_0$$

$$= b_0 + x_i \odot b$$

bias

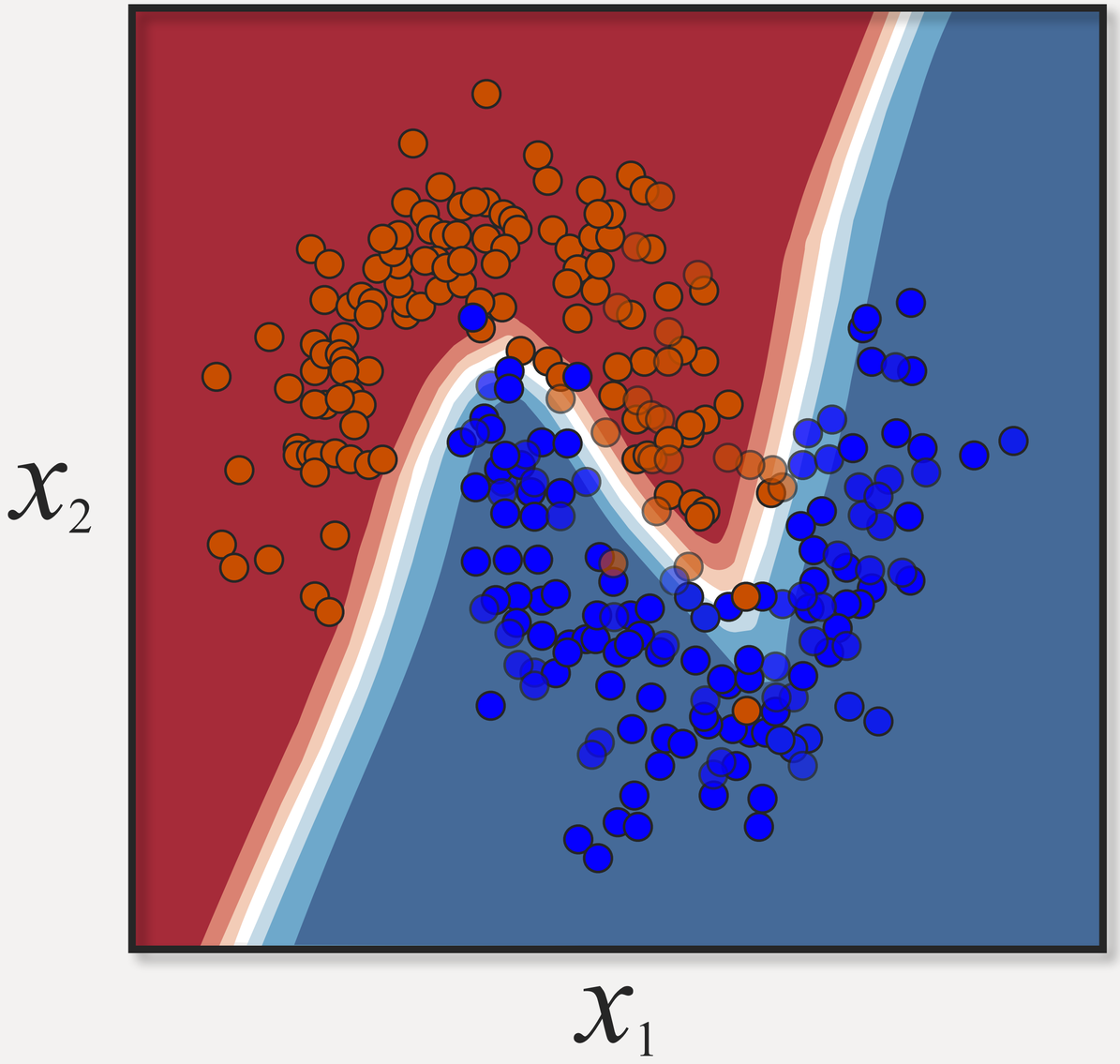
inner product

Limitations of Logistic Regression



Linear

- Linear classifiers can only represent limited relationships
- Often want to use a classifier that can handle non-linearities


x_2
x_1

Logistic regression is only effective when a linear classifier can easily distinguish between class 1 and 0