

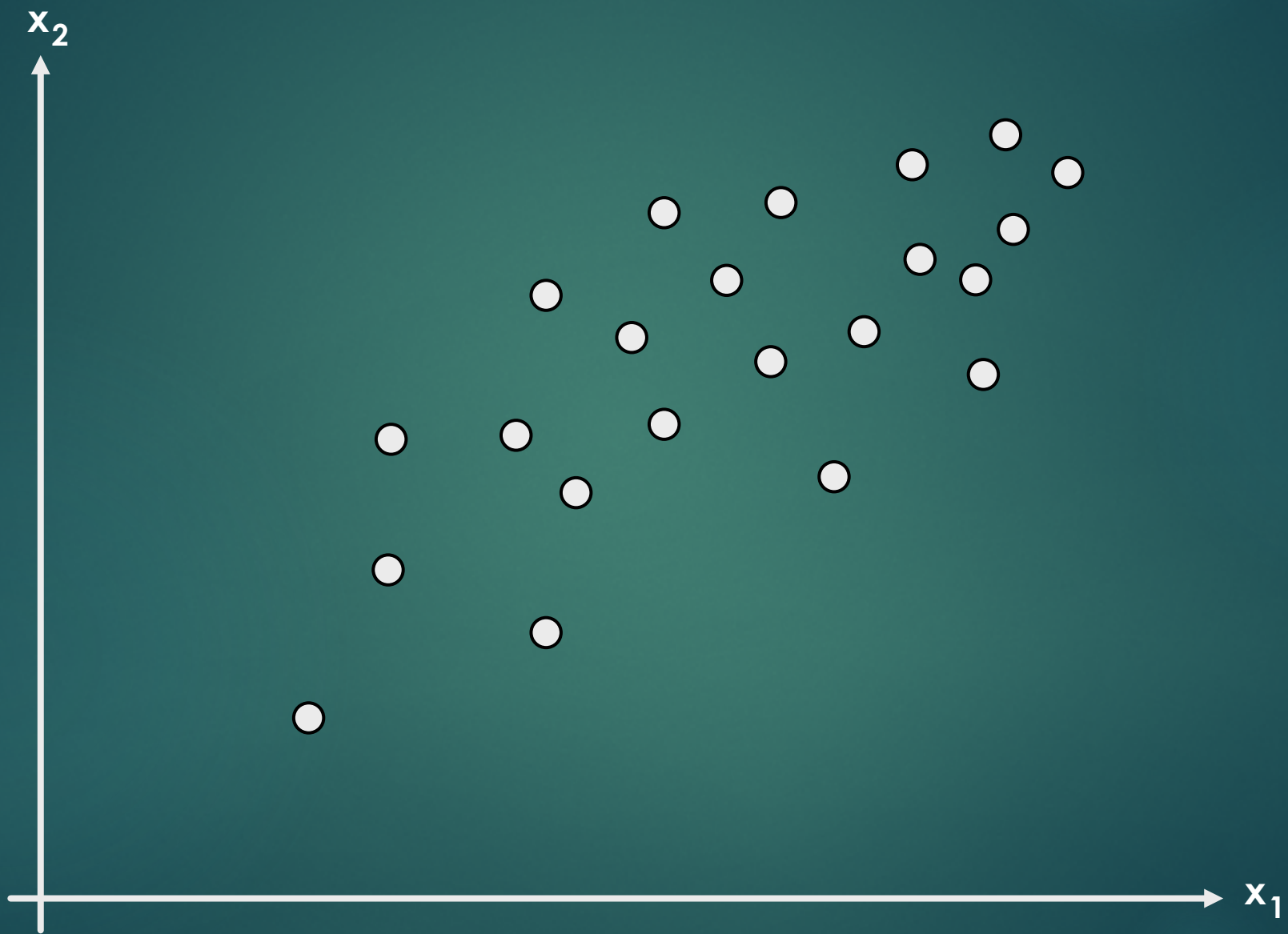


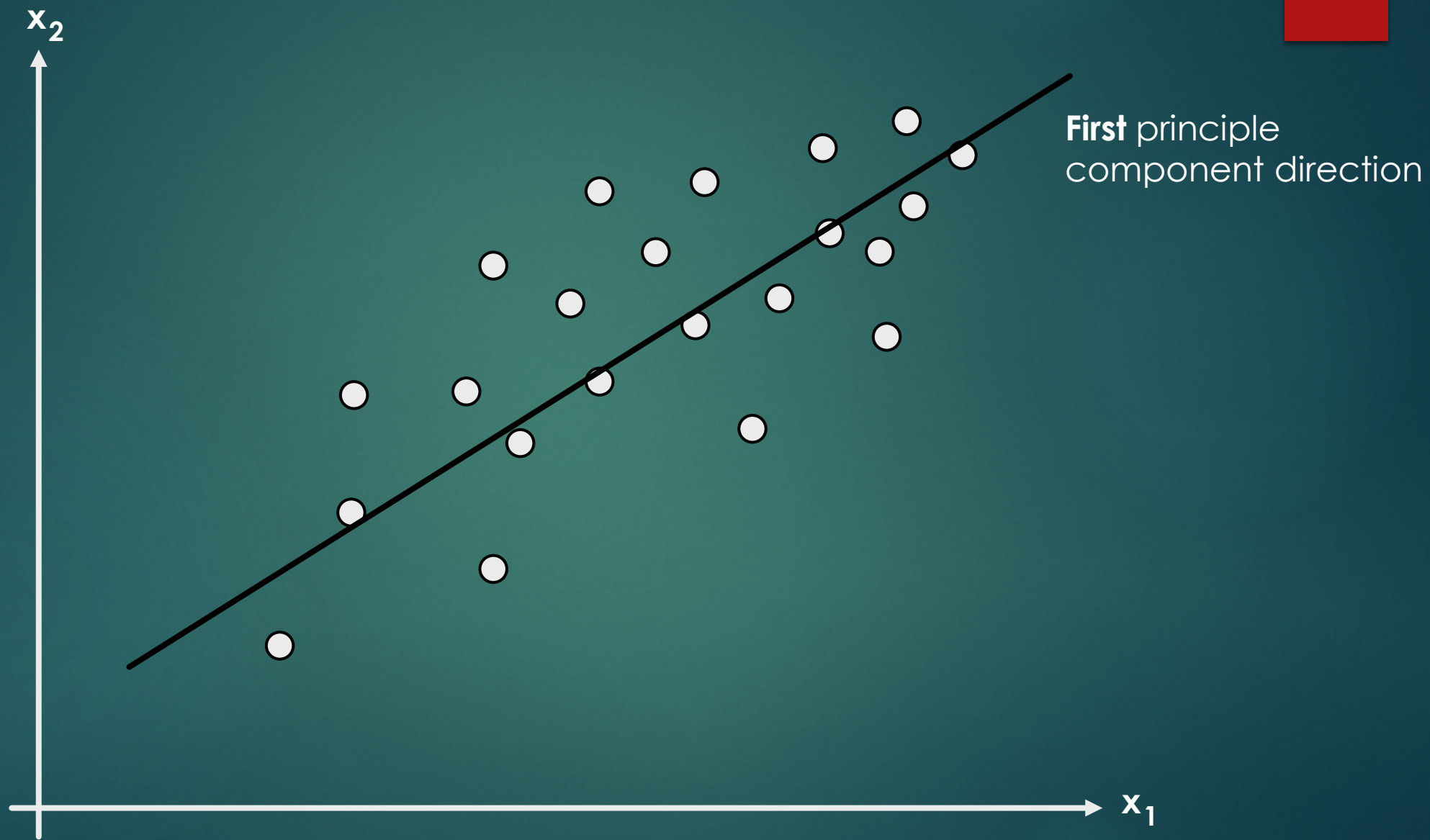
MACHINE LEARNING

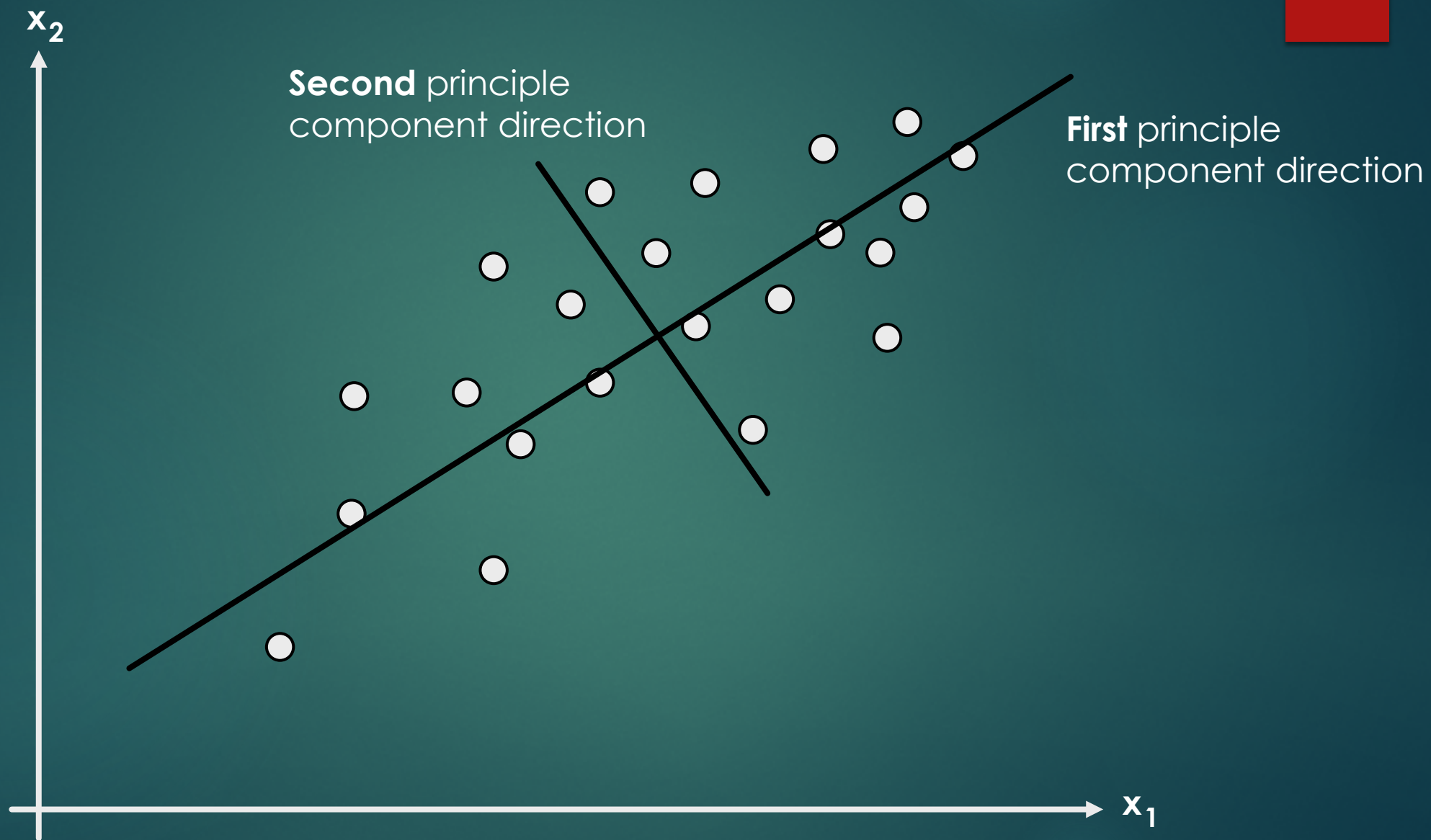
PRINCIPAL COMPONENT ANALYSIS

Principal component analysis

- ▶ **PCA** gives us a low dimensional representation of a dataset
- ▶ It is able to find linear combinations of features / variables that are mutually uncorrelated
- ▶ Linearly uncorrelated variables: these are the principal components
- ▶ For example: height in **[cm]** and in **[m]** are not independent !!!
- ▶ We can get rid of several unnecessary features: we keep the important ones
- ▶ Also good for visualization







Principal component analysis

- ▶ **PCA** can be done by eigenvalue decomposition of a data covariance / correlation matrix
- ▶ Or → singular value decomposition of a data matrix usually after mean centering