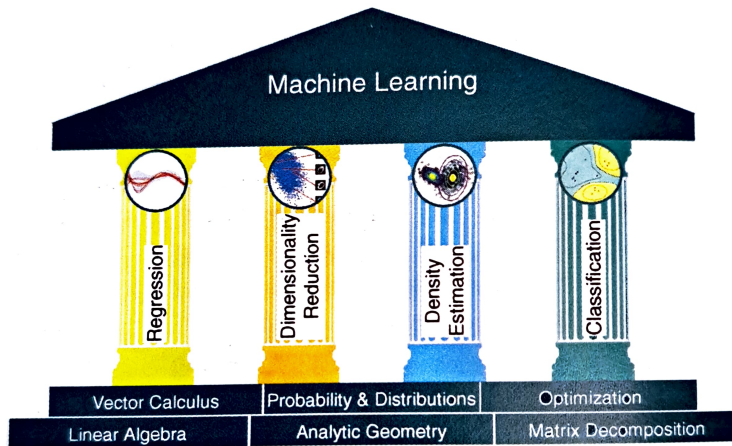


Principle component analysis unit

- ▶ What PCA is (**Today**)
- ▶ Applications of PCA (Wednesday, in lab)
- ▶ The math of PCA (Friday)
- ▶ PCA algorithms (next week Monday)

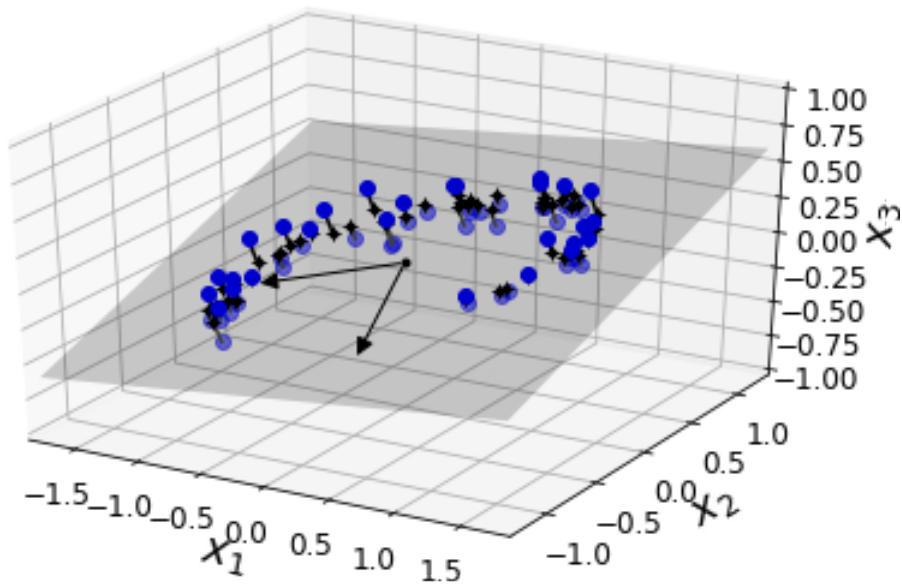
Today:

- ▶ How PCA fits in with machine learning
- ▶ Vector spaces and subspaces
- ▶ Definition of principle components
- ▶ Preview of the math

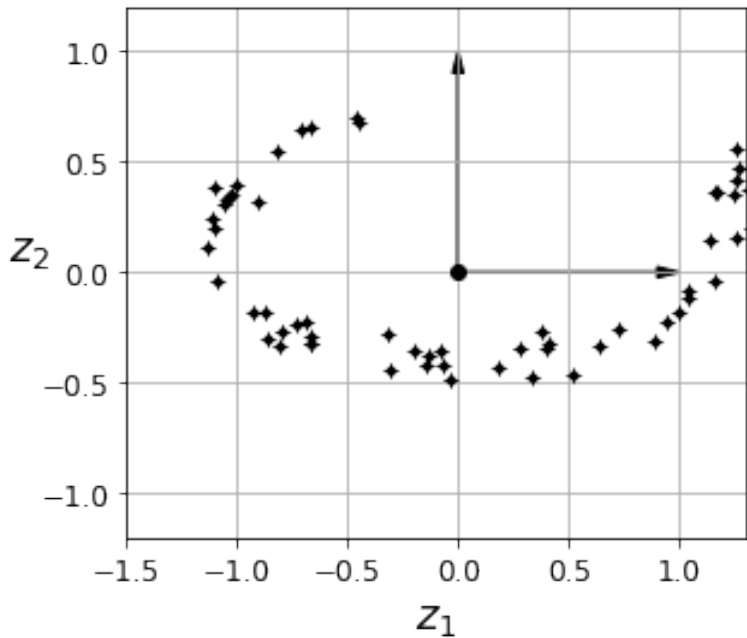


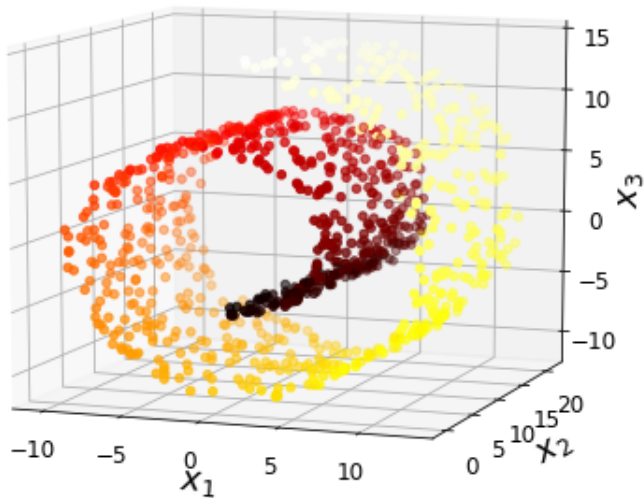
Deisenroth et al, pg 6.

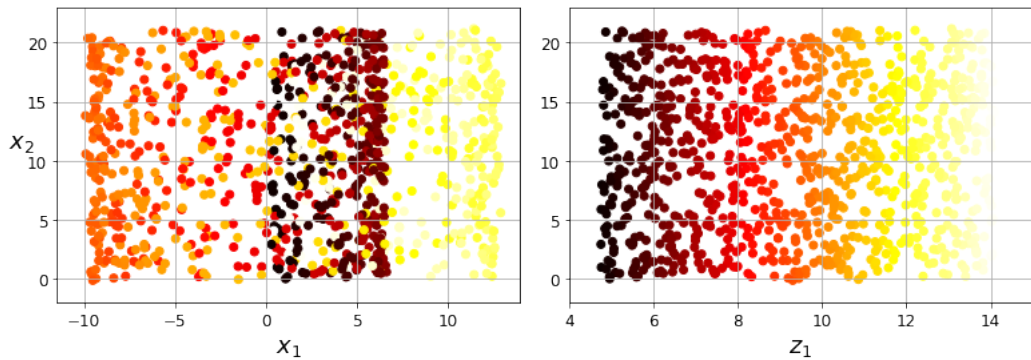
*An important motivation for [models with continuous latent variables] is that many data sets have the property that the data points all lie close to a **manifold** of much lower dimensionality than that of the original data space. Bishop, pg 559*



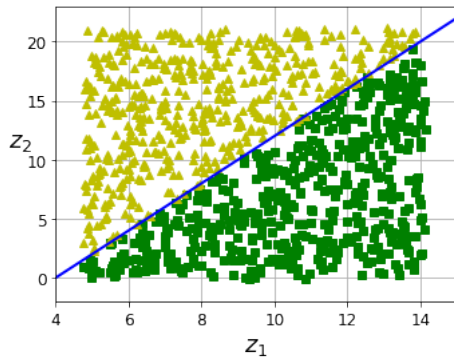
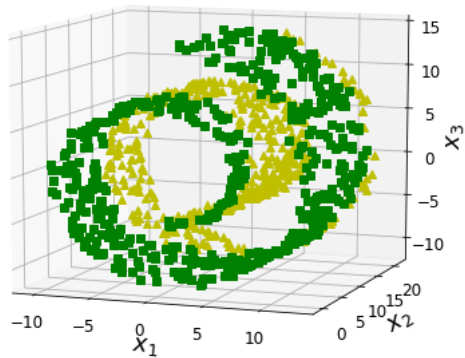
Aurélien Géron, *Hand-On Machine Learning with Scikit-Learn & TensorFlow*, O'Reilly, 2017. Pg 210



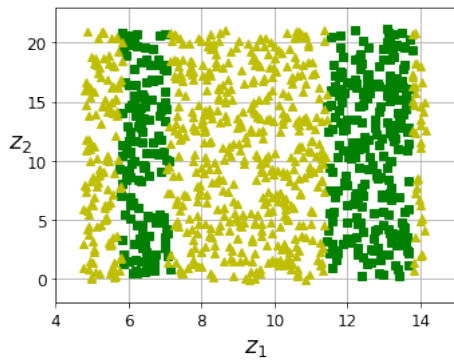
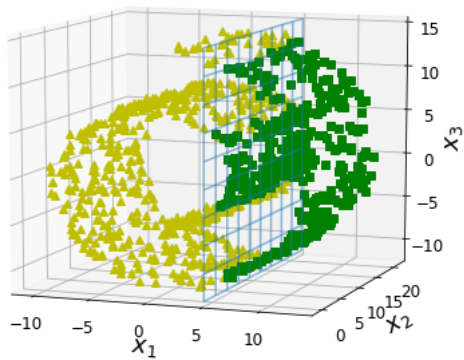




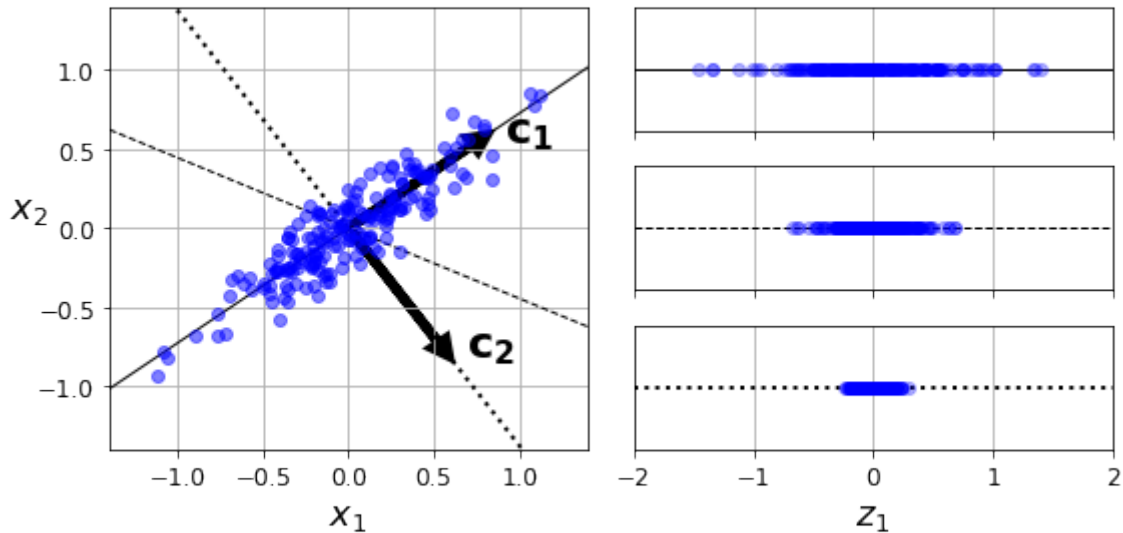
Aurélien Géron, *Hand-On Machine Learning with Scikit-Learn & TensorFlow*, O'Reilly, 2017. Pg 211



Aurélien Géron, *Hand-On Machine Learning with Scikit-Learn & TensorFlow*, O'Reilly, 2017. Pg 213



Aurélien Géron, *Hand-On Machine Learning with Scikit-Learn & TensorFlow*, O'Reilly, 2017. Pg 213



Aurélien Géron, *Hand-On Machine Learning with Scikit-Learn & TensorFlow*, O'Reilly, 2017. Pg 214