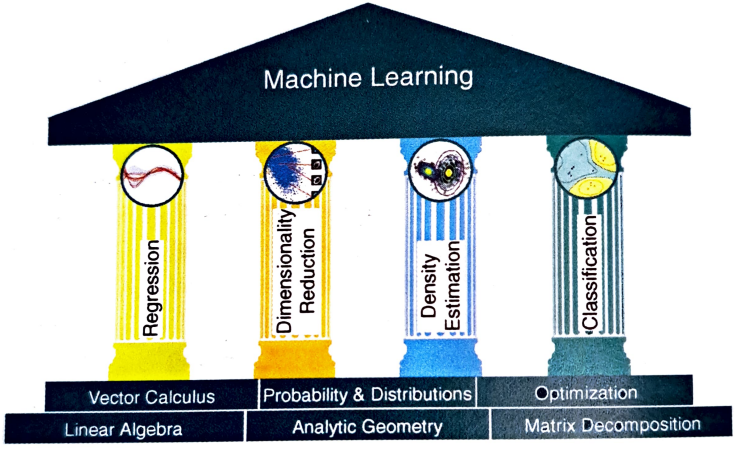
Principle component analysis unit

- 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



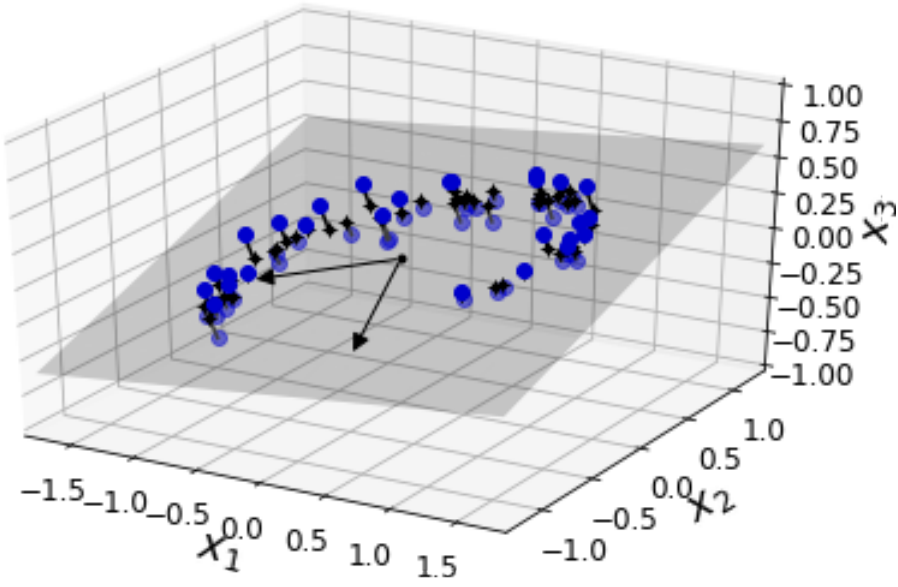

Deisenroth et al, pg 6.

*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.*

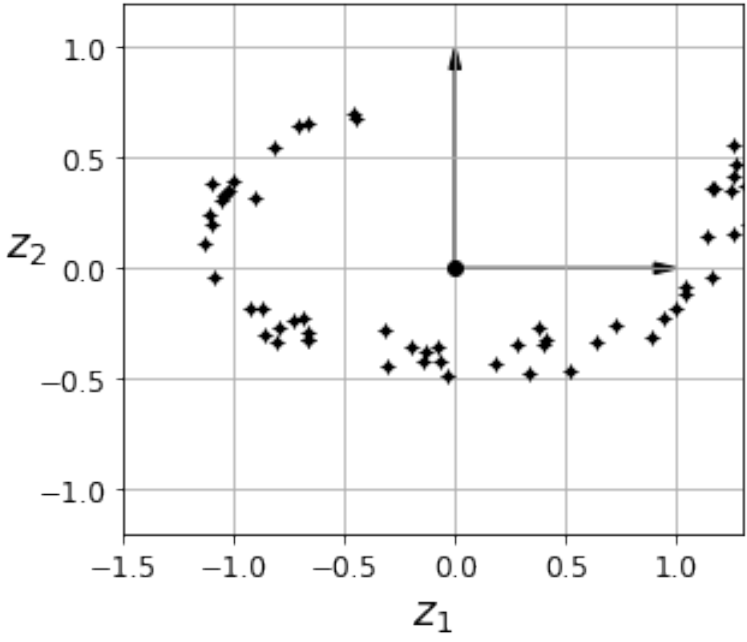
*Bishop, pg 559*

*Dimensionality reduction can be motived by the fact that data might lie in a low-dimensional* **manifold** *embedded in a high-dimensional space.*

*Han Veiga and Ged, pg 170*




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

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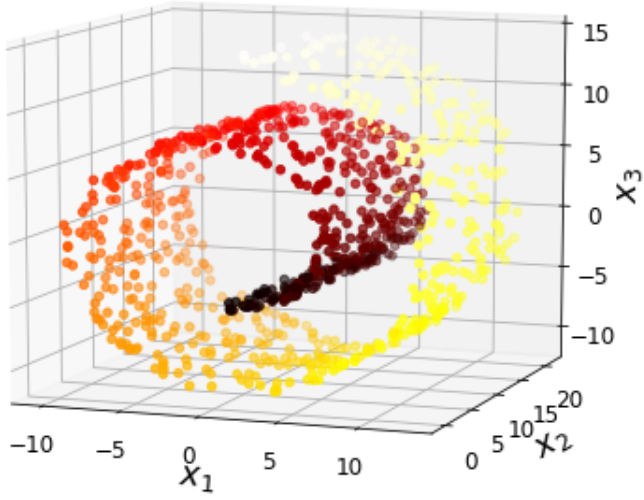


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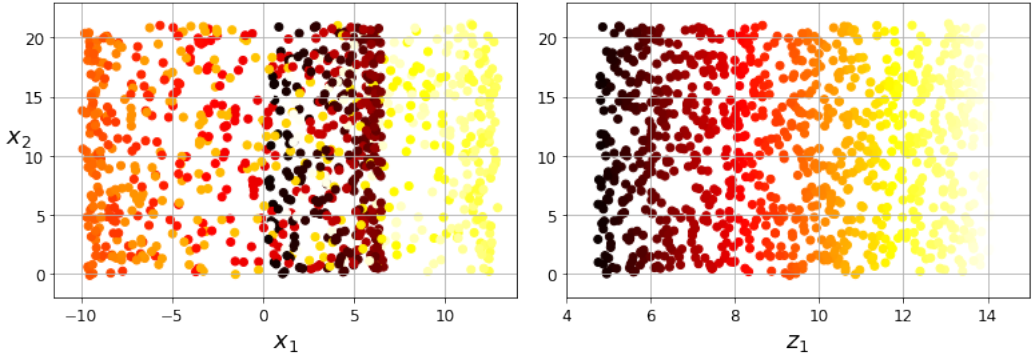


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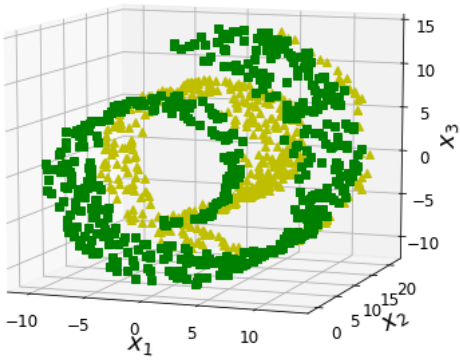


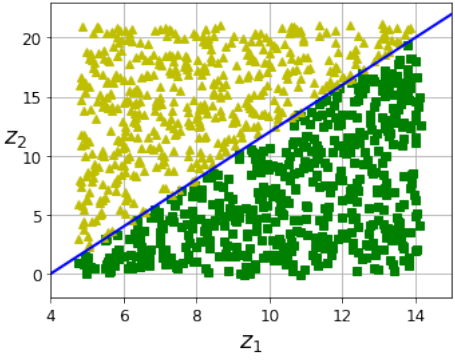


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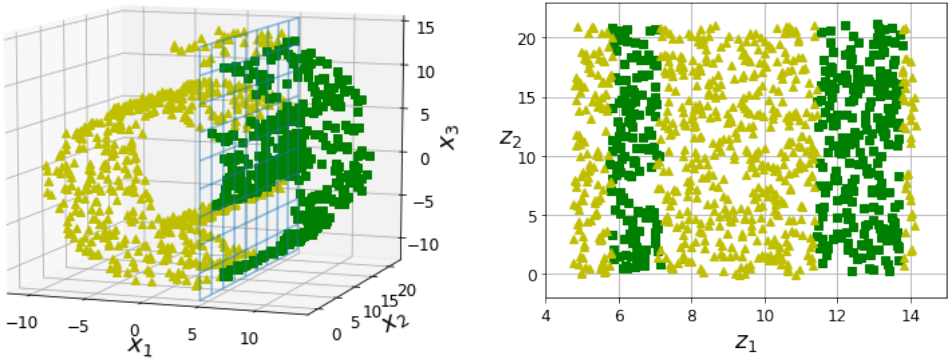


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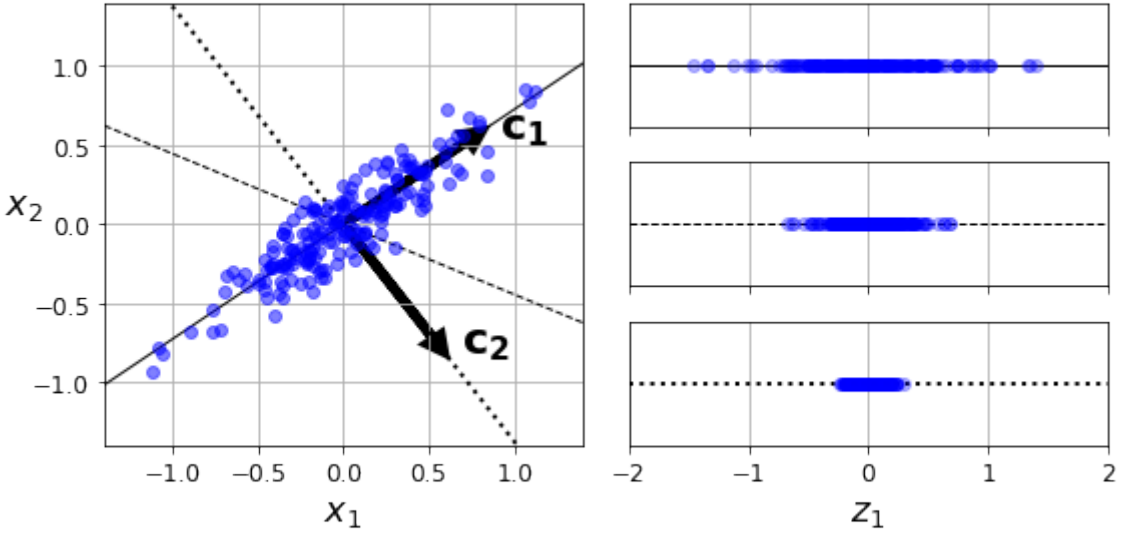


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**Coming up:**

**Due Fri, Mar 28:**
*Textbook reading from Chapter 10 (see Canvas)*

**Due Mon, Mar 31:**
*Take PCA quiz*

**Due Fri, Apr 4:**
*Implement PCA*

*(There will be an ethics reading thrown in here sometime)*