# Dimensionality reduction (DR) task overview

* A small video with an example of what DR is  
  [Dimensionality Reduction](https://www.youtube.com/watch?v=3uxOyk-SczU)
* A lecture from Stanford University:  
  [Lecture 46 — Dimensionality Reduction - Introduction | Stanford University](https://www.youtube.com/watch?v=yLdOS6xyM_Q)

## PCA

* An explanation of PCA from StatQuest:  
  [StatQuest: Principal Component Analysis (PCA), Step-by-Step](https://www.youtube.com/watch?v=FgakZw6K1QQ)
* An explanation of PCA from an author of courses on Udacity:  
  [Principal Component Analysis (PCA)](https://www.youtube.com/watch?v=g-Hb26agBFg)

## SVD

* A lecture from Stanford University:  
  [Lecture 47 — Singular Value Decomposition | Stanford University](https://www.youtube.com/watch?v=P5mlg91as1c&t)

## t-SNE

* A blog post from DataCamp about t-SNE:  
  <https://www.datacamp.com/community/tutorials/introduction-t-sne?utm_source=adwords_ppc&utm_campaignid=1455363063&utm_adgroupid=65083631748&utm_device=c&utm_keyword=&utm_matchtype=b&utm_network=g&utm_adpostion=&utm_creative=332602034358&utm_targetid=aud-390929969673:dsa-429603003980&utm_loc_interest_ms=&utm_loc_physical_ms=9047073&gclid=Cj0KCQjww_f2BRC-ARIsAP3zarEuvGIVjjJbhVLfxNSoPC_pJr45dnYT-tgU4GYLopUZm0NIUeFabnYaAsUzEALw_wcB>
* Original research paper:  
  <http://www.jmlr.org/papers/volume9/vandermaaten08a/vandermaaten08a.pdf>

## UMAP

* A documentation page:  
  <https://umap-learn.readthedocs.io/en/latest/>

## Performance validation metrics

* How to choose the number of components when working with PCA:  
  <https://www.mikulskibartosz.name/pca-how-to-choose-the-number-of-components/>
* How to choose the number of components when working with SVD:  
  <https://chrisalbon.com/machine_learning/feature_engineering/select_best_number_of_components_in_tsvd/>

# Additional

* UMAP: a paper with the algorithm description  
  <https://arxiv.org/abs/1802.03426>
* SVD: A series of small lectures about SVD:  
  [Singular Value Decomposition (SVD): Overview](https://www.youtube.com/watch?v=gXbThCXjZFM&list=PLMrJAkhIeNNSVjnsviglFoY2nXildDCcv)
* SVD: An explanation of matrix factorization through gradient descent from an author of courses on Udacity:  
  [How does Netflix recommend movies? Matrix Factorization](https://www.youtube.com/watch?v=ZspR5PZemcs)
* NMF
  + Videos:
    - [Non-Negative Matrix Factorization (NMF) | Multiplicative Update Rules By Lee And Seung](https://www.youtube.com/watch?v=o4pPTwsd-5M)
    - [10701: Non-Negative Matrix Factorization](https://www.youtube.com/watch?v=UQGEB3Q5-fQ)
    - [Nonnegative Matrix Factorizations for Clustering, Haesun Park, Georgia Institute of Technology](https://www.youtube.com/watch?v=EKvh4ANUHWM)
  + Scikit-learn pages:
    - <https://scikit-learn.org/stable/modules/generated/sklearn.decomposition.NMF.html?highlight=nmf#sklearn.decomposition.NMF>
    - <https://scikit-learn.org/stable/auto_examples/applications/plot_topics_extraction_with_nmf_lda.html#sphx-glr-auto-examples-applications-plot-topics-extraction-with-nmf-lda-py>