Discussion L10 (Deep learning representations)

1) What is feature engineering? What does learning representation mean, imply? How do DNNs work with data features?

2) How is learning representations supposed to support the functionality of DNNs or help in applications? How does it compare to other ANN architectures examined in the course so far?

3) What is your intuitive take on the quality of representations? What characteristics a "good" code should have?

4) Design a DL system that forms or classifies multi-modal perceptual memories, e.g. images and sounds. What could be a computational basis of multi-modal processing?

5) Why would you expect a DNN trained to map the same inputs to different sets of labels (multi-tasking) to learn "better" representations?

6) What are relative advantages of sparse and distributed forms of representations? How would you propose to control the level of sparseness?

7) Which argument why deep learning offers such fundamental progress in performance on many pattern recognition problems do you find most convincing?

8) What is your intuition behind a generative DNN model based approach to learning representations? Is it a promising direction and why? What would you consider a key "selling point" in favour or against this approach?