

Variational Deep Autoencoder

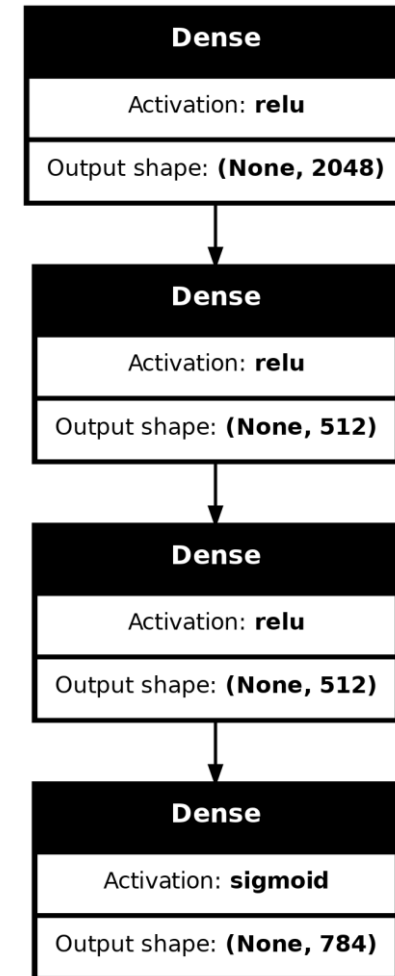
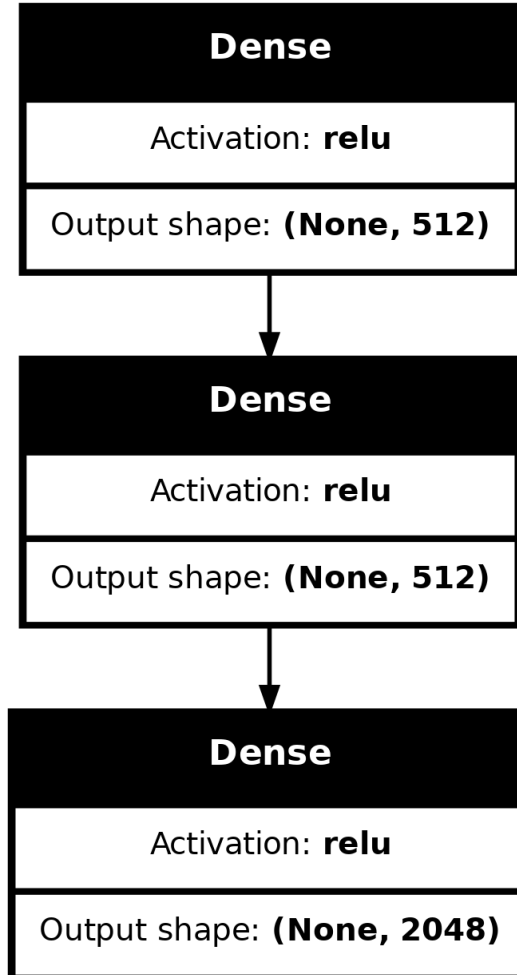
Michał Gromadzki

What was done?

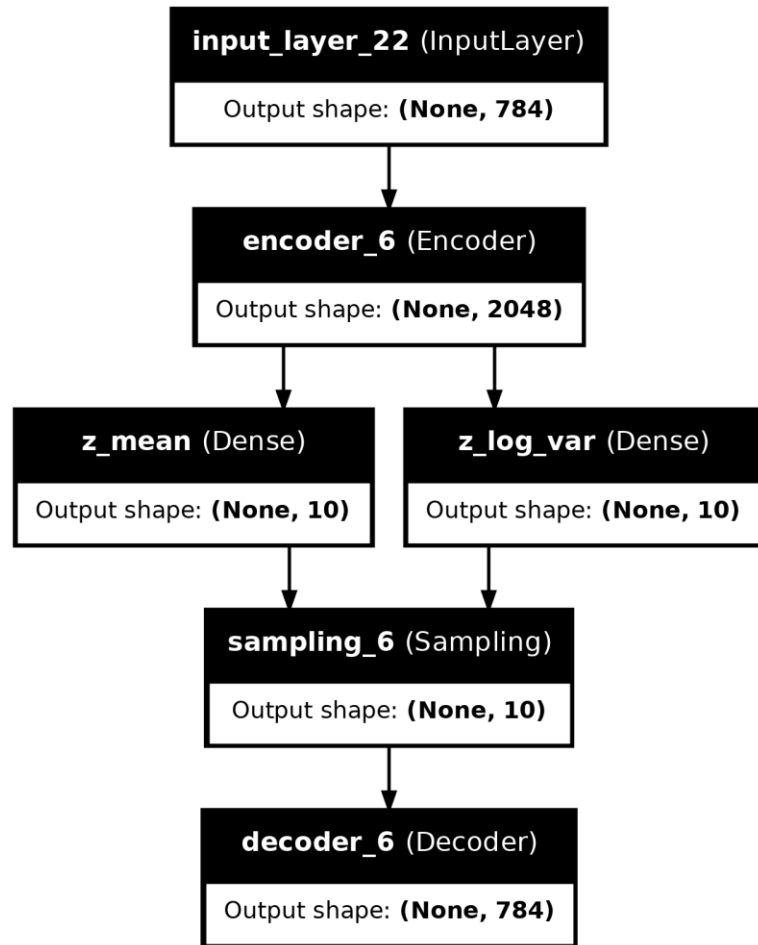
- VAE
- VaDE
- ELBO for VaDE
- Pretraining for VaDE
- Latent space visualization
- Generation of new observations
- Computation of clustering metrics



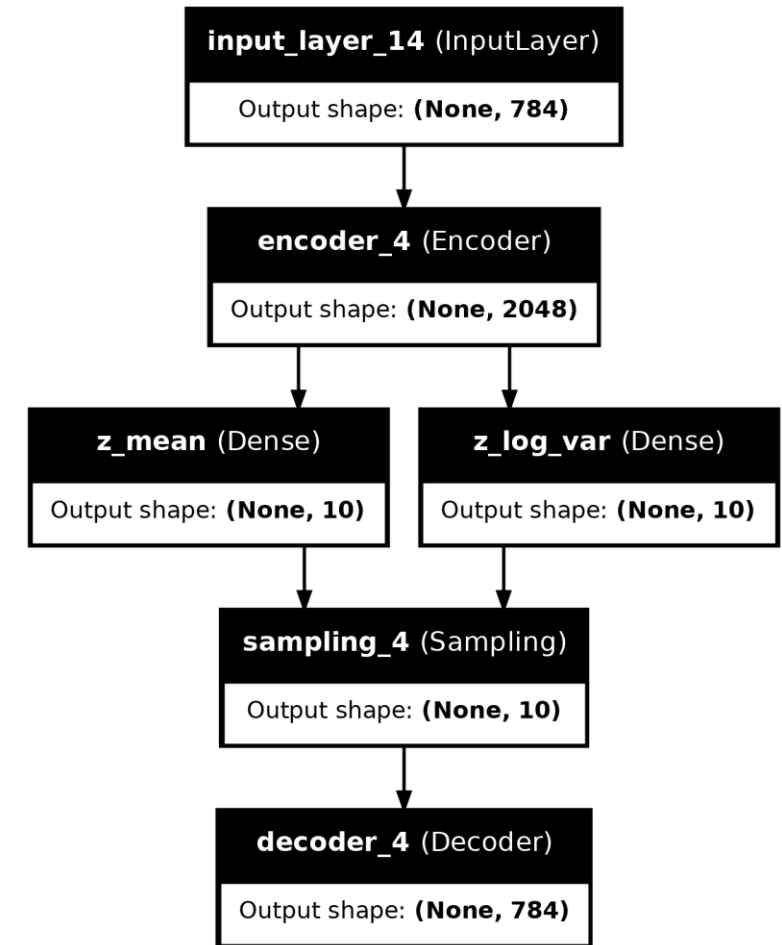
Encoder and Decoder



VaDE vs VAE



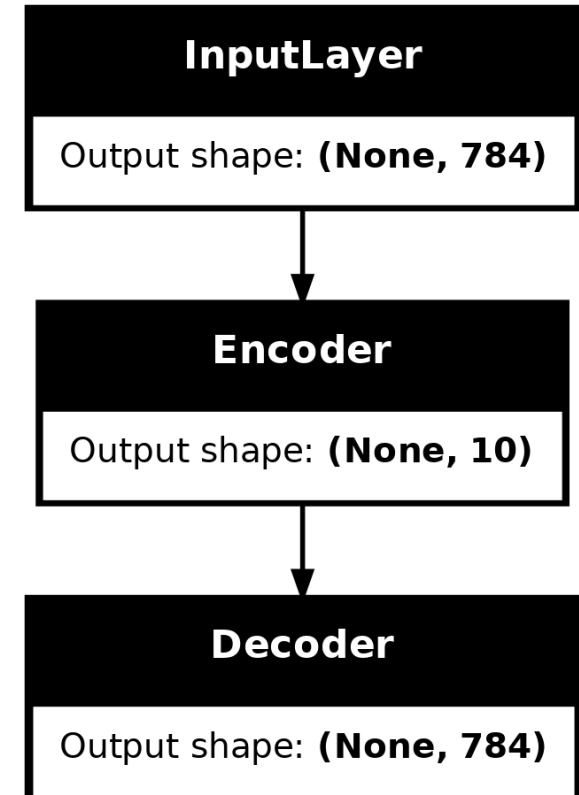
No. Of Params: 3 492 854



No. Of Params: 3 492 644

Pretraining of VaDE

- Train autoencoder and use its weights as starting points
- Run gaussian mixture model on latent space



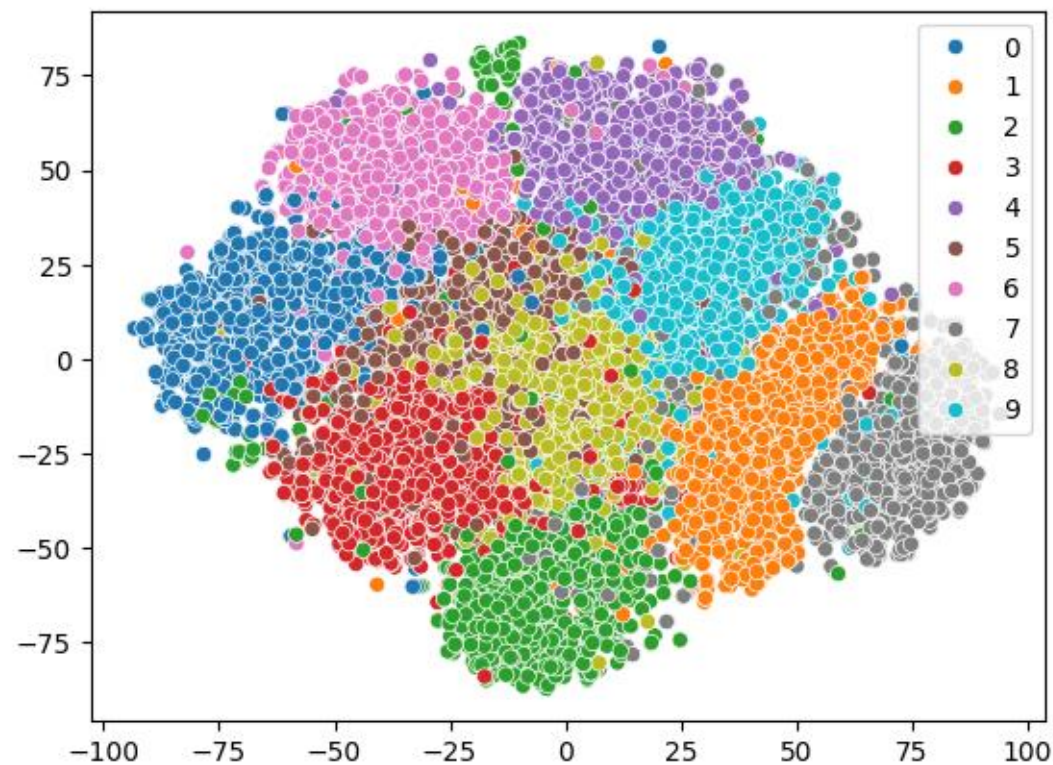
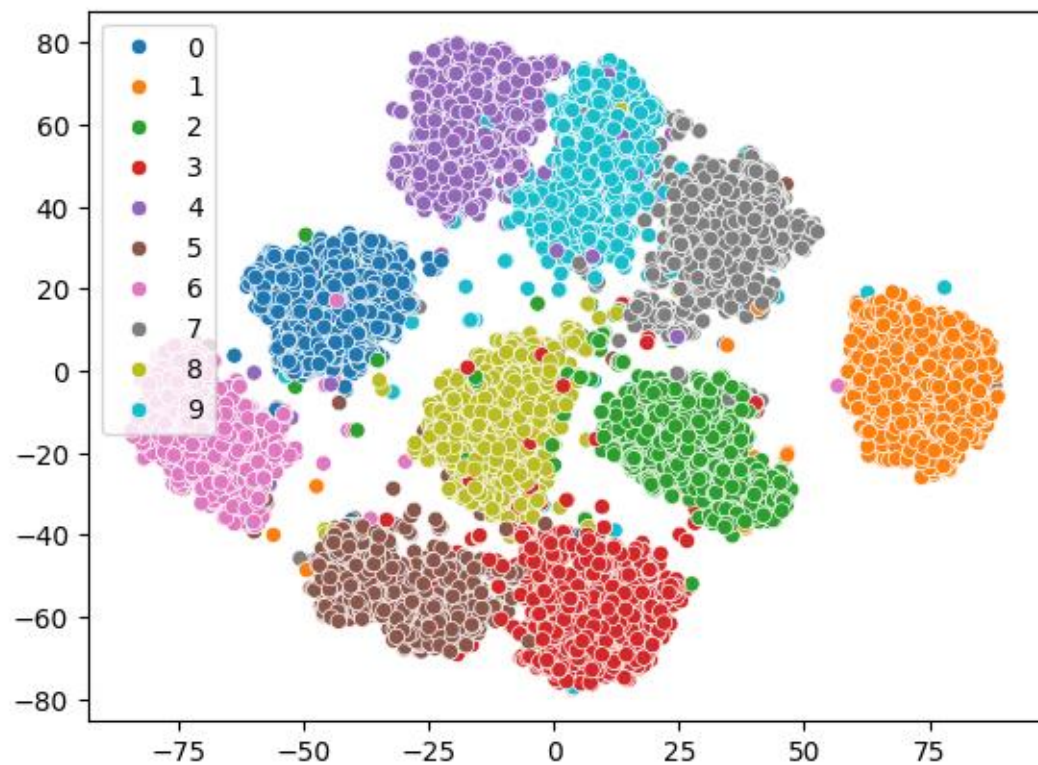
Metrics

- Cluster_accuracy: 0.8167
- V_measure_score: 0.7648

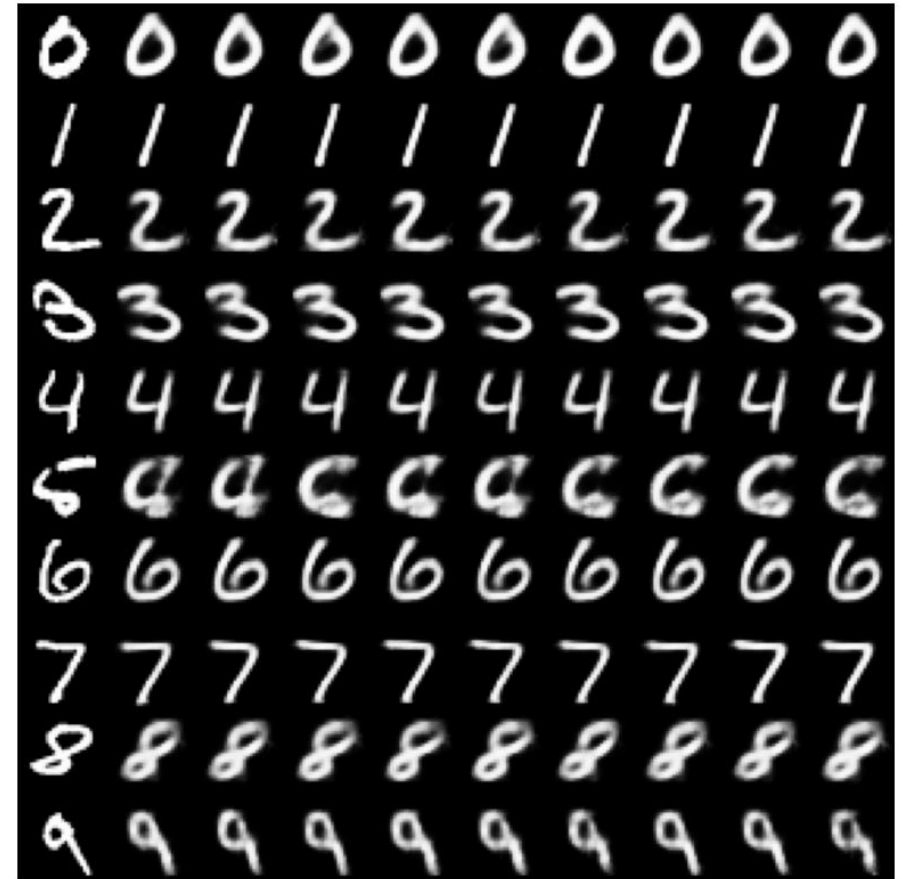
	VAE	VaDE
silhouette_score	0.089	0.189
calinski_harabasz_score	4662.5	7623.4

Table 1: Metrics for VAE and VaDE

Latent space



Generated observations



Bibliography

- **Variational Deep Embedding: An Unsupervised and Generative Approach to Clustering** [Zhuxi Jiang](#), [Yin Zheng](#), [Huachun Tan](#), [Bangsheng Tang](#), [Hanning Zhou](#)
- https://github.com/kozlovskia/Variational_Clustering