
EXAM PROJECT FOR PML 2022/2023

REPORT

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1 Density modeling

1.1 Implement a convolutional VAE

1.2 Alternative models

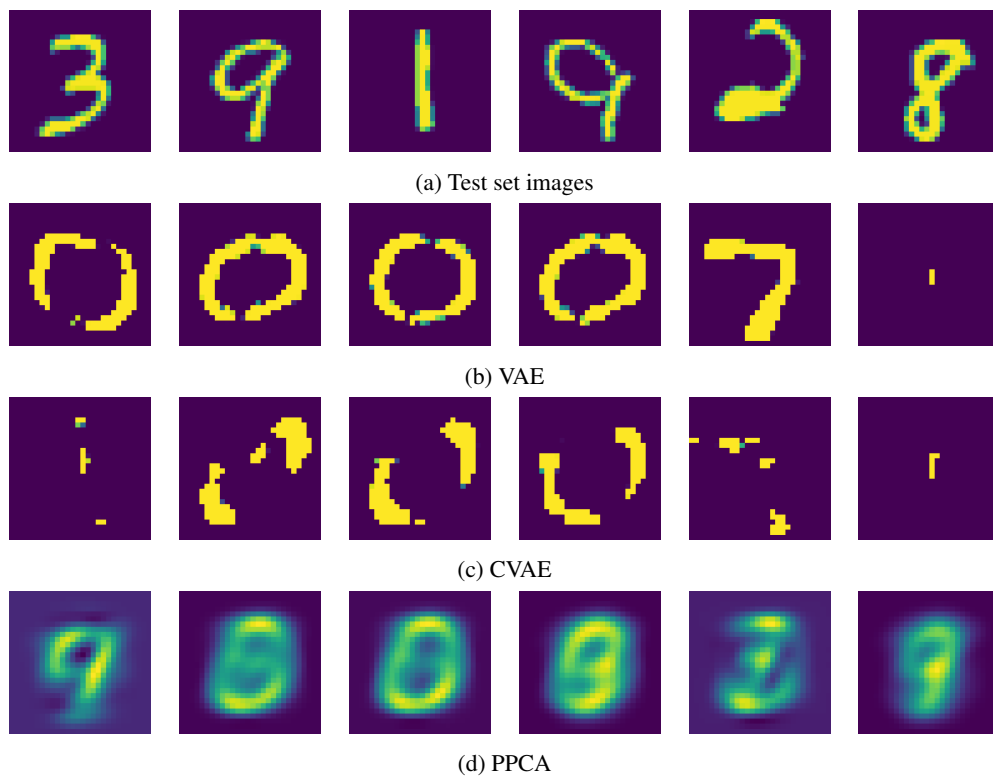


Figure 1: Comparison of MNIST test set images and corresponding mean parameters generated by density models

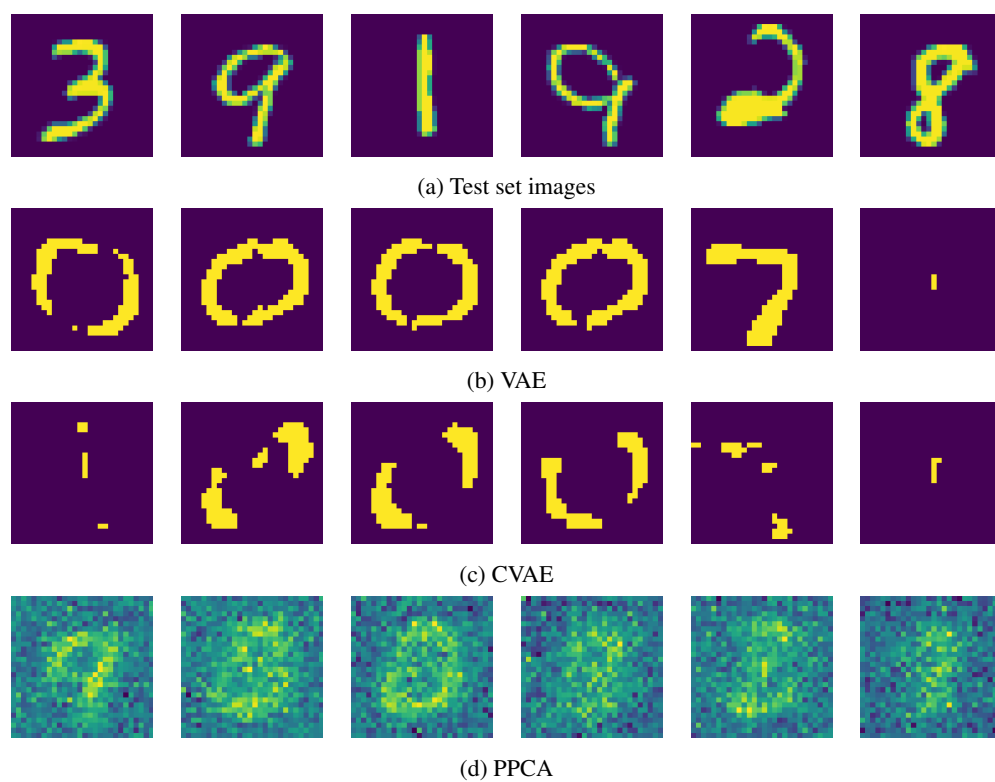
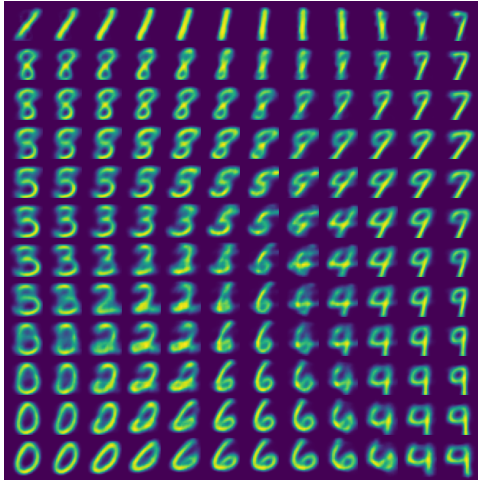
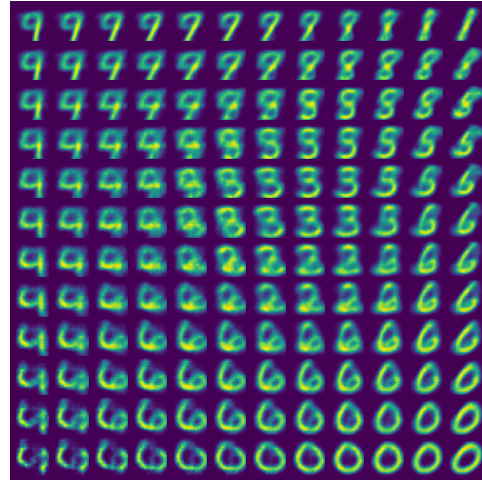


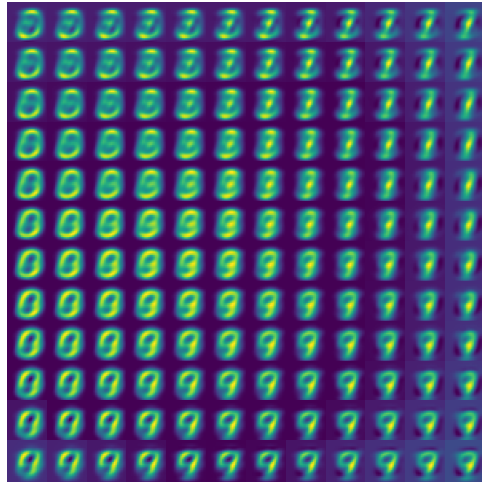
Figure 2: Comparison of MNIST test set images and corresponding reconstructions sampled from density models



(a) VAE



(b) CVAE



(c) PPCA

Figure 3: Interpolating images from latent space variables using trained density models.

	Log-Likelihood/ELBO	MSE
VAE	-145.122048	0.000305
CVAE	-157.241749	0.000352
PPCA	-4329.655559	3629.099862

Table 1: Model performance metrics

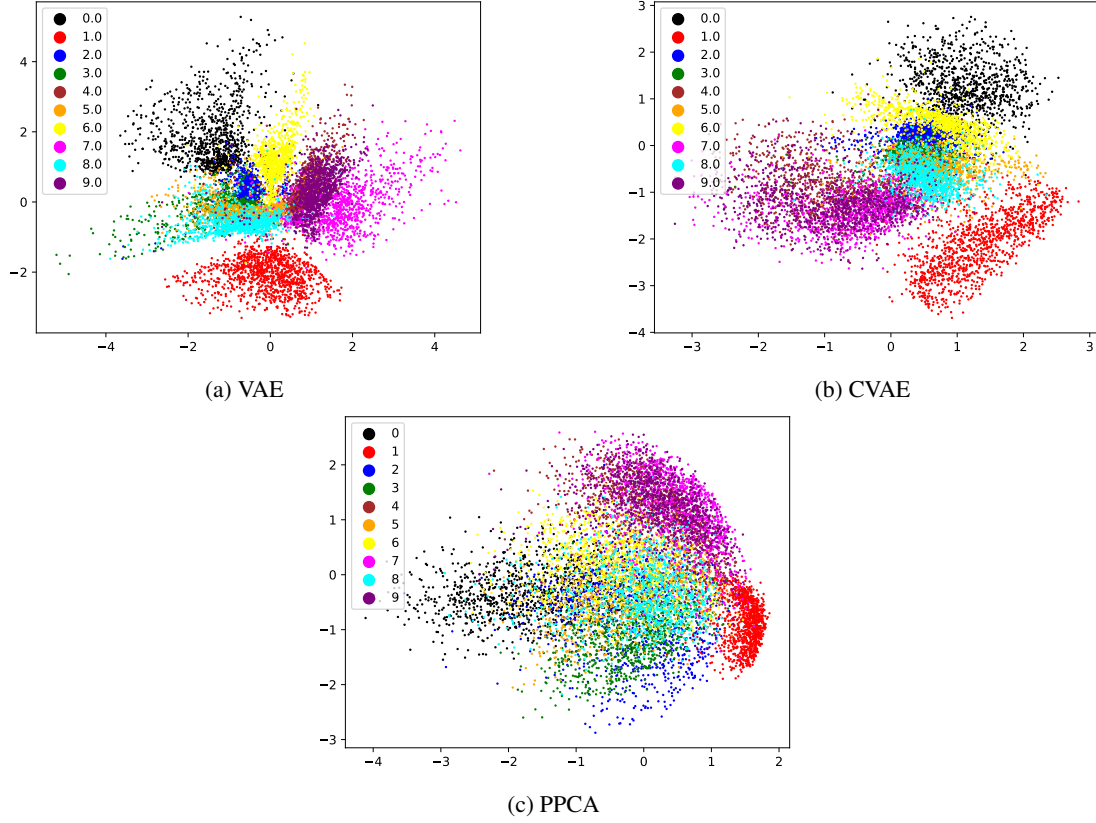


Figure 4: Clustering on MNIST test (projection to latent space) using trained density models.

2 Function fitting

2.1 Fitting a GP with Pyro

2.2 Bayesian Optimization

3 Bibliography