# MedMINST VAE 3

TECHNISCHE UNIVERSITÄT DARMSTADT

**Zixuan Fang, Ruben Härle, Felix Künnecke**

**MOTIVATION**
Generating Medical image data with VAEs.

**DATASETS**
We choose three different datasets to train our VAEs:

- PathMNIST
- BloodMNIST
- OrganMNIST

**METHOD**
We developed our VAE project iteratively starting with a very simple implementation of a standard VAE. In the next steps, we implemented more advanced VAE variants that disentangle the latent space. We evaluated all three different VAE variants based on the produced regenerated results.

**IMPLEMENTATION**
We implemented the following VAE variants and trained them for 100 epochs:

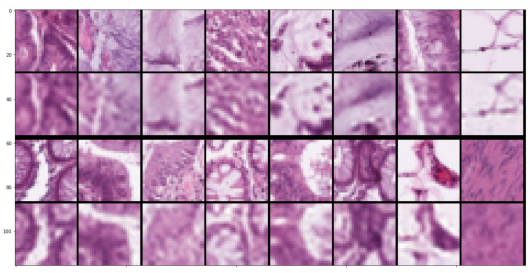
- β-VAE
- VQ-VAE
- CVAE

the code is publicly available on Github.

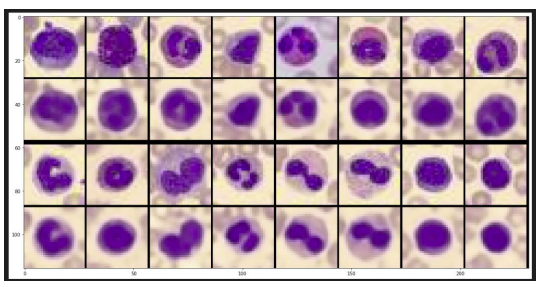
**β-VAE and VQ-VAE produced best results for the medical image generation.**

**RESULTS**
We were able to generate the best results with the β-VAE and VQ-VAE with a latent space of 128. The CVAE learned to abstract classes to be considerable for the regeneration of medical images. Our results are displayed at the bottom. Rows 1 and 3 are the original images and rows 2 and 4 are the regenerated ones by our VAEs.

PathMNIST



BloodMNIST



OrganMNIST