

1. **Intro to Autoencoders**
2. **Import TensorFlow and other libraries**
3. **Load the dataset**
4. **First example: Basic autoencoder**
5. **Second example: Image denoising**
 - **Define a convolutional autoencoder**
6. **Third example: Anomaly detection**
 - **Overview**
7. **Load ECG data**
8. **Normalize the data to [0,1].**
9. **Plot an anomalous ECG.**
10. **Build the model**
11. **Detect anomalies**
12. **Choose a threshold value that is one standard deviations above the mean.**
13. **Classify an ECG as an anomaly if the reconstruction error is greater than the threshold.**
14. **Convolutional Variational Autoencoder**
 - **Setup**
 - **Load the MNIST dataset**
15. **Use *tf.data* to batch and shuffle the data**
 - **Define the encoder and decoder networks with *tf.keras.Sequential***
 - **Encoder network**
 - **Decoder network**
16. **Reparameterization trick**
17. **Network architecture**
18. **Define the loss function and the optimizer**
19. **Training**
 - **Generating images**
 - **Display a generated image from the last training epoch**
 - **Display an animated GIF of all the saved images**
 - **Display a 2D manifold of digits from the latent space**

