Assignment: Variational Autoencoder for Image Generation

Introduction

Train a VAE using a manually collected dataset (e.g. surrounding objects or selfies of team members) and then use the trainer VAE to generate new, acceptable images of these objects

Data Collection

- collect a dataset ensuring diversity (e.g. selfies dataset: diversity in facial expressions, lighting conditions, and poses)
- Each object should have a unique class label
- Hint: You can use data augmentation techniques in order to increase the dataset size (e.g. rotation, flipping, lightening…)

Implementation of Variational Autoencoder

Design the architecture of the VAE, including the encoder, sampling layer, and decoder.

Generation of Acceptable Images

After training, team members should use the trained VAE to generate new images from the latent space.

Acceptance Criteria

The generated images MUST be at least has the generic shape of the object (e.g. in case of selfies dataset: an image of a human (any non-human images will not be accepted))

Bonus

1. Use Conditional Variational Auto Encoder to generate images with specific class label (an image for specific team member or object)
2. Use a slider as GUI interface to determine the number of images ot be generated (hint: easy to implement on colab)