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Analysis and Comparative Investigation of Various Generative Adversarial Network Approaches for the Generation of Fake Images.

ABSTRACT - Masterthesis

In the field of computer vision and artificial intelligence, deep learning has gained a lot of importance due to its varied approaches. One such approach is the development of Generative Adversarial Networks, otherwise known as GANs. This new framework has shown its flexible performance in the field of image processing. Like how the human brains are capable to imagine scenarios and events of a particular happening based on a past experience, new developments have enabled Generative Adversarial Networks to achieve this kind of human imagination artificially using datasets. GANs can also be used for supervised and semi supervised learning similar to unsupervised learning.

The main focus of this thesis will be on a detailed literature analysis on GAN theory and its principles. Furthermore, the idea behind the development of the different GAN approaches such as CGAN, DCGAN, Wasserstein model, etc. will also be analysed and comparatively investigated as part of this thesis. In addition, the experimental part of this thesis deals with the production of synthetic images, i.e. fake images of digits and faces by training the GANs on sufficient databases from varied sources. Such fake images tend to be fairly realistic and therefore allow many interesting applications in the field of image processing and machine learning, especially in applications where the databases are too small for reliable classifier training, as frequently encountered in radar, sonar and medical imaging applications.