

Deep Neural Network Autoencoder for Agriculture Meadow

Student

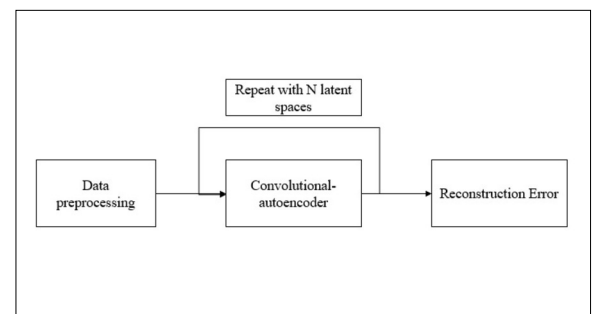
Severin Weiss

Einleitung: Plant diseases not only affect the quality of fruits and vegetables but also often cause a significant reduction in global crop production. In terms of economics and sustainability it is important decreasing crop failure to a minimum. To approach this ideal state, the process of agricultural manufacturing is required to be more optimized and a huge number of methods was proposed to deal with this problem. However, not all the approaches bring good results without any negative influence. Common methods, such as the use of chemicals like fungicides and insecticides to control diseases and insect, has caused adverse effects in agricultural ecosystem. Traditional detection methods for plant illnesses depend on manual recognition, this may lead to miss detection. Thus, this attracts many scientists and researches' attention in order to recognize diseases automatically.

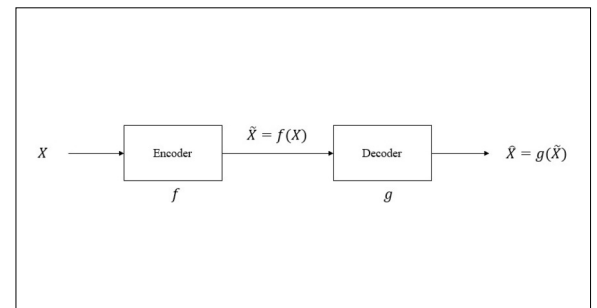
Vorgehen / Technologien: The presented model meadow autoencoder is shown in Figure 1. Model of meadow reconstruction with agriculture meadow dataset. The process can be described in three main parts. First the data is preprocessed, so that the images have the appropriate shape. Afterwards the images are given as input into the convolutional autoencoder (CAE). Lastly the reconstruction error is calculated from the CAE. Step number two is repeated for several latent dimensions

Ergebnis: The reconstruction error is decreasing as the latent dimension is increasing, this is an expected result. The interesting region is from 4 to 16 where there is an expected decrease as well, since the predicted number of different plants in the meadow should be around 12 to 16.

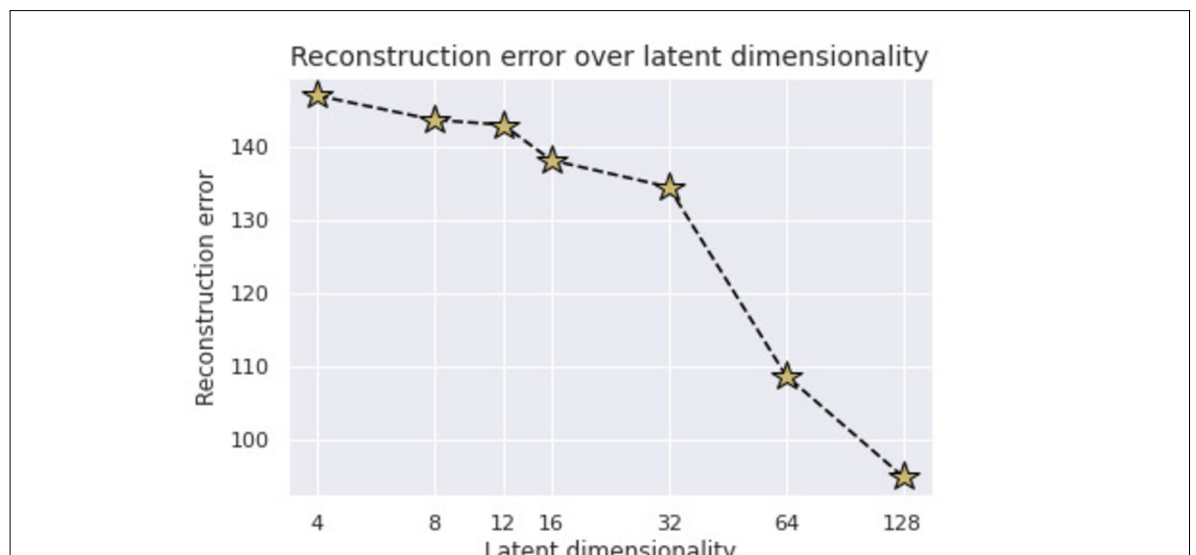
Model of meadow reconstruction with agriculture meadow dataset
Eigene Darstellung



Structure of an autoencoder
Eigene Darstellung



Reconstruction error over latent dimensionality
Eigene Darstellung



Referent
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