

Animal image recognition

Abstract

Image recognition is a topic that gained a lot of popularity in the last few years thanks to the new technologies that can be used in image classification and its numerous usages. A few projects which benefit from animal recognition are classifying huge amounts of images, finding lost animals and observing certain species in the wild. This thesis focuses on creating a robust application able to detect and recognize animals in images using pre-trained classifiers and models. The application also gives to users the opportunity to build their own classifiers and models on the animals they want, using their own dataset.

For detection we use Cascade Classifiers which are made of by assembling simple classifiers that are applied on certain regions of the training images, based on how many quality features are present. For recognition we follow a Neural Network approach using Convolutional Neural Networks (ConvNets) which are specialized in detecting patterns and operate over raw pixel intensities in images. The ConvNets architecture is built using the VGGNet model, winner of ILSVRC 2014.

The accuracy of the trained classifier depends on many factors, such as the quality of the training dataset, the animals used or the value of the parameters selected on training. The results indicate that the training images need to contain mostly the animal that needs to be found, while also containing some background sceneries so the classifier is as robust as possible. The application can also be updated in the future by using new-found technologies or by improving the already existing architecture of the neural network.

References

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