Exposé - Deep Learning

Aerial Cactus Identification

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We implement an Convolutional Neural Network to learn a classifier that detects cacti based on an kaggle challenge[1].

1 Motivation

Object detection or object recognition is one of the most common problem across scientific fields. One of the more popular In the scope of this project we want to implement a

2 Data

The dataset[2] consists of 17,500 aerial images out of which 13,136 contain an columnar cacti and 4,364 do not. Each image is 32x32 in size. The images have been resized by kaggle to be uniform in size. The dataset also contains an .csv file that annoates for each image if it contains an columnar cacti or not. The images are all from the Tehucan-Cuicatlan valley in the south of Mexico [4]. The images have been obtained using a drone from an flight altitude of 100 m. The images were manually labeled.

3 Implementation

For implementation we plan to use Python 3.7 with keras[3] and sciPY[5], in particular numpy and pandas. If we have enough time left at the end of the project we might also try different libraries and compare if we can get better results that way.

References

[1] Kaggle. Aerial cactus identification. URL `https://www.kaggle.com/c/aerial-cactus-identification`. Accessed: 2019-05-21.

[2] Kaggle. Aerial cactus identification data, 2019. URL `https://www.kaggle.com/c/aerial-cactus-identification/data`. Accessed: 2019-05-21.

[3] keras. Keras: The python deep learning library. URL `https://kears.io/`. Accessed: 2019-05-21.

[4] Efren Lopez-Jimenez, Juan Irving Vasquez-Gomez, Miguel Angel Sanchez-Acevedo, Juan Carlos Herrera-Lozada, and Abril Valeria Uriarte-Arcia. Columnar cactus recognition in aerial images using a deep learning approach. *Ecological Informatics*, 2019. ISSN 1574-9541. doi: https://doi.org/10.1016/j.ecoinf.2019.05.005. URL `http://www.sciencedirect.com/science/article/pii/S1574954119300895`.

[5] SciPY. Aerial cactus identification. URL `https://scipy.org/`. Accessed: 2019-05-21.