Automated recognition of people and identification of animal species in camera trap images

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ABSTRACT: Camera traps are increasingly being used in wildlife monitoring. The great advantage of camera traps in comparison with other sampling methods is that very accurate data can be collected without the animal being collared or tagged nor the researcher being present. However, such camera trapping frameworks produce high volumes of pictures which often need to be reviewed manually. Convolutional neural networks can be used to automate this labour intensive process.

In our work, we use existing manually labelled images from a camera trap study conducted by the Research Institute for Nature and Forest in collaboration with Hasselt University (Belgium) to train a convolutional neural network for identifying animal species. Images were annotated using the camera trap application Agouti (www.agouti.eu). In this way images can be automatically labelled or the network can be incorporated into annotation applications to provide a suggestion to the users and as such speed up the annotation process.

In addition to conveying the presence or absence of species, the images may contain other useful information, for example animal attributes and behaviour. Therefore, getting help from wildlife enthusiasts via citizen science, may be desirable to review the large amounts of data. However, since cameras are mounted in public nature reserves, there always exists the risk that passers-by have triggered the camera traps. For privacy reasons, images showing people cannot be made public. Removing these images from the dataset can be automated by training the network to recognise people in addition to identifying animals species, before the data can be made available to volunteers.

KEYWORDS: image recognition, classification, camera traps