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BirdGuide: Developing a Mobile Platform to Identify the Categories of Sri Lankan Bird Species

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Abstract

Identification of different kind of bird species is a challenging task even for professional bird watchers. The main challenges involving in this problem are varied poses of the birds, size or portion of the bird in the image, different backgrounds and large intensity variation in images as pictures are taken in different times of the day, etc. Therefore, an automated classification system for bird species recognition is needed for many practical applications. We will use this mobile app as a solution to that problem. Bird watchers can take photos of that bird and upload it in the app. The application will help them to classify the species and will provide a small description of the bird to the user. Recent machine learning and in-deep learning research have put much of focus on facial recognition, which involves detecting faces within images, taking specific features into account and finally determining whose face in the picture. According to previous work Convolutional neural networks (CNN), which is a popular deep learning architecture designed to process data in multiple array form, show great success to almost all detection & recognition problems and computer vision tasks. In our project, we demonstrated that our data augmentation method with CNN is suitable for image classification problem, and it significantly increases the performance of the classifier. With the help of a convolutional neural network with one input layer, one softmax output layer and two hidden layers, BirdGuide will suggest an identification almost instantly with a basic description without any complicated procedures. The best performance of the model trained on the original data set is 43.62%, but the performance for the models trained on the augmented data sets achieves a score of 83.40%, which shows clear improvement as the augmented training set size increases.

Keywords: automated classification, deep learning, machine learning, convolutional neural network

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