Mobile-based Primate Image Recognition using CNN

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Abstrak

Enam dari 25 spesies primata yang paling terancam punah berada di Indonesia. Primata ini yaitu Orangutan, Lutung, Bekantan, Tarsius tumpara, Kukang, dan Simakobu. Tiga dari enam primate tersebut kebanyakan hidup di pulau Kalimantan. Salah satu bentuk pelestarian khazanah primata yang terdapat di Kalimantan adalah dengan melakukan studi identifikasi primata. Pada penelitian ini dikembangkan aplikasi android dengan metode CNN untuk mengidentifikasi citra primata di lahan basah Kalimantan. CNN digunakan untuk mengekstrak fitur spasial dari citra primata sehingga sangat efisien untuk masalah identifikasi citra. Dataset yang digunakan dalam penelitian ini adalah ImageNets, sedangkan model yang digunakan adalah MobileNets. Aplikasi diuji menggunakan dua skenario yaitu menggunakan foto dan rekaman video. Foto diambil secara langsung, kemudian diperkecil menjadi resolusi 256 x 256. Untuk video, video diambil dalam waktu kurang lebih 10 hingga 30 detik dengan resolusi kamera 2 megapiksel. Hasil pengujian didapatkan rata-rata akurasi 93,6% saat menggunakan foto dan 79% saat menggunakan rekaman video. Setelah dilakukan perhitungan akurasinya, selanjutnya dilakukan uji usability dengan menggunakan SUS. Berdasarkan hasil SUS diketahui bahwa aplikasi yang dikembangkan layak untuk digunakan.

Kata kunci*— Pengenalan Gambar, Aplikasi Seluler ,CNN*

Abstract

Six out of 25 species of primates most endangered are in Indonesia. Six of these primates are namely Orangutan, Lutung, Bekantan, Tarsius tumpara, Kukang, and Simakobu. Three of the six primates live mostly on the island of Borneo. One form of preservation of primate treasures found in Kalimantan is by conducting studies on primate identification. In this study, an android app was developed using the CNN method to identify primate species in Kalimantan wetlands. CNN is used to extract spatial features from primate images to be very efficient for image identification problems. The data set used in this study is ImageNets, while the model used is MobileNets. The application was tested using two scenarios, namely using photos and video recordings. Photos were taken directly, then reduced to a resolution of 256 x 256. Then, videos were taken in approximately 10 to 30 seconds with two megapixel camera resolution. The results obtained was an average accuracy of 93.6% when using photos and 79% when using video recordings. After calculating the accuracy, the usability test using SUS was performed. Based on the SUS results, it is known that the application developed is feasible to use.

Keywords— *Image Recognition, Mobile-based, CNN*

1. INTRODUCTION

Primates play an important role in research to improve human health. Despite being a small part of animals that are used in the biomedical field, primates share genetic and physiological similarities with humans, making them invaluable in developing treatments and vaccines for human diseases [1]–[3]. Primates also have important ecological functions in the ecosystems they inhabit, such as providing pollination services [4] and recognized as having an important role as a disperser of plant seeds [5]–[7] particularly in tropical rainforests [8].