AR service for pet's supplies using deeplearning based on Marker-less AR

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Abstract

The number of families living with pets is increasing. Accordingly, sales of related products are also increasing. It's convenient to buy products online, but users can't see or place the products before they buy them.
If users can experience and place products before purchasing, satisfaction will increase. In order to do so, it is necessary to have a technology that automatically determines the species of pets and place products around pets. Therefore, we developed application that can classify pet species using deep learning and compare and place products with AR.

Keywords: *Deep Learning, AR(Augmented Reality), Andriod*

1. Introduction

To detect characteristic point using brightness difference can make frequent errors [1]. Using deep learning data with plenty of images can reduce the errors. With deep learning data we can check and classify animal species [2]. This application customizes itself with the user's pet type and adds the AR models to their own pet. The animal supplies market scale has grown dramatically. The sales of the items and the online stores related to pet supplies are increasing too. Despite online stores convenience, they have some issues about experiencing the items directly. So we tried to develop a service which can experience the item in the customer's own place. The users can compare items conveniently and also put them on their place with their pet. Using 3D models and AR we offer the service about the optimized items for customer's pet species and AR experiencing application based on Marker-less with deep learning.

2. Methodology

The application structure is shown in figure 1. This research experiment aimed to develop convenient service to purchase user's pet product using deep learning and AR technology. Deep learning is used to classify pets' species and breed name. Pre-processing for learning oxford-iiit pet dataset in a deep learning model based on the MobileNet model structure. Convert the implemented model to Tensorflow lite so that it can be operated on mobile. This model delivers classified pet species to AR. AR is used to place 3D models around pets. Using Instant Tracking of Wikitude to implement Marker-less based AR. It works in initialization state and tracking state. Space is defined in the initialization state and 3D model is placed in the tracking state. And Interactivity enables multiple AR models to be placed and used. So AR models related to pet species received from Tensorflow Lite is placed on the Activity.

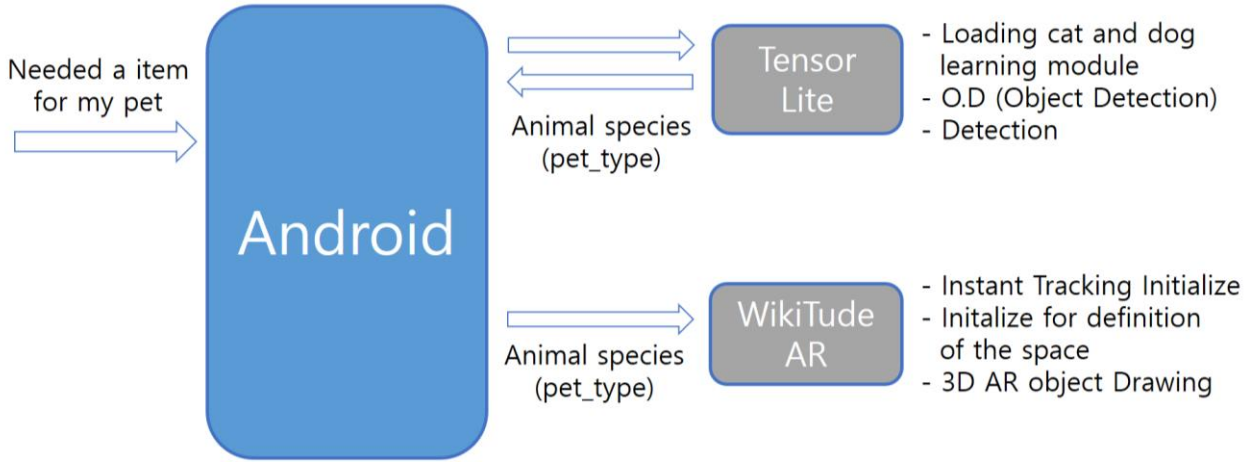

Figure 1. The structure of Application

3. Result

When the customer turns on the camera and place their pet. AI which is learned by deep learning represents whether the pet is dog or cat and the pet's species. Using the data the application main activity is customized with the customer's pet. In AR experiencing activity, the data from deep learning users can place the items for their pet everywhere they want. Also, they can resize the items and move the item's location. Each item is used by touched the icon at the bottom of the screen. Customers can experience the items as they are using them in reality. In the list of the items, users can see the information about name and price of items.

Figure 1. Main Activity

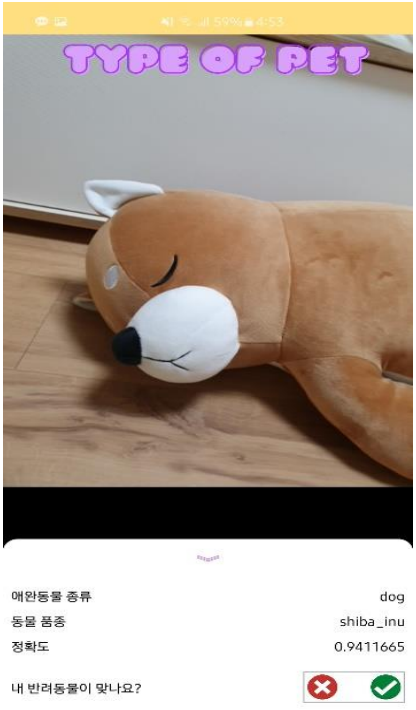

Figure 2. Check my pet Activity

Figure 3. AR Activity

Figure 4. List of the items

4. Conclusion

This study developed AR application using Deep-learning. Through the combination of Deep-learning and AR shown in this study, it has been proved that active tracking in various forms is possible not only for one factor but also for AR tracking in the future. To implement this, the main problem was the flexible connection between Deep-learning Activity and AR Activity. This problem could be solved by applying the various references provided by Android and wikitude. In addition, Instant Tracking is possible anytime, anywhere by developing it with Marker-less based AR technology.

Through these studies, it was confirmed that AR technology, which is popular in various industries, can be applied in various ways. In this study, animals were recognized by Deep-learning, but it can be developed in various ways, including recognizing animals, people, objects, or tesseract.

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