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Identification of image object based on machine learning using tensorflow

Wempy Virgana [a], *Apriansyah* [b,*]

[a] *Muhammadiyah University of Palembang, Palembang, Indonesia*
[b] *Muhammadiyah University of Palembang, Palembang, Indonesia*

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CORRESPONDENCE

E-mail: apriansyah@um-palembang.ac.id*

A B S T R A C T

Image identification is one of the machine learning / artificial intelligence methods that can be used to detect an image quickly. This is one of the technological breakthroughs in science, especially in the field of computers. Object detection and recognition provides a new challenge on how to make machines detect objects automatically. Creating a machine learning model that has the function to determine the position and identify many objects in an image is still a major challenge in computer vision. Currently, many computing resources and intelligent algorithms can do this, but this feature can only be obtained by configuring a special machine to detect objects.

I. Introduction

Machine Learning in it there are parameters that have the character of an object with a classification method. There are two stages in making the classification model, namely the first by training the data and providing differences with different classes, then the second by classifying and evaluating unknown objects. As quoted by (Matuska, Hudec, Kamencay, Benco, & Zachariasova, 2014)

"The collection of features or parameters characterizing the object by classification methods to handle classification tasks are used. There are two phases of creating a classification model. First, training data collections are used to set up the classification model parameters to distinguish different classes. Then, the classifier is able to, regarding classification model parameters, successfully evaluate an unknown object to the appropriate class . In this work, for classification model combination bag of keypoints and Support Vector Machine methods are used." Computers can help us to understand how humans think as has been quoted by (Warwick & Shah, 2016) "What we do is agree with Turing that engineering a machine to think can help us to understand how it is that we humans think". As we already know that in the current era Machine Learning has been successful for example in predicting financial applications and there have been many studies in predicting bankruptcy. The purpose of this research is to implement artificial intelligence in the image identification program so that the computer can identify an object through an image.

This program has been implemented and will be further developed for future purposes. A lot of research on intelligence then solves all problems and problems as well as in the business world to predict bankruptcy which aims to assess the level of risk of failure, besides that in the digital world of technology that makes computer systems seem alive at the same time they can think and have intelligence. Based on this, the author intends to create an image identification program using the TensorFlow framework. The purpose of making this program is to implement an artificial intelligence program into an image identification system on a computer so that the computer can identify an object through images.

II. Method

To be more focused, the methodology used in this research are:

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1. Interview Method That is the author conducts direct interviews with those who are experienced in the field of artificial intelligence.
2. Literature Method That is by searching and studying books and some appropriate e-books and journals that the author is looking for on the internet in order to give a better understanding of the topic of writing and enrich the author's knowledge about artificial intelligence.
3. Observation Method Namely the author made direct observations of experts in the field of artificial intelligence and practiced directly in the process of making identification systems through images. The function of this program is to create an artificial intelligence engine that can be trained by using data sets and processed by this artificial intelligence engine to identify an image that can later be opened via a web application.

III. Results and Discussion

Contains the results of research and or development that will be carried out in the concept of writing based on what is stated in the introduction. This research is applicable in the form of an experiment. The first step needed is to create an application that can distinguish an object. This discussion will describe the types and methods of obtaining data, as well as methods of data analysis and research frameworks. In this program design specification provides an overview of the program created, consisting of input form specifications, output form specifications, file specifications, program specifications and flowcharts. Further explanation of the design specifications of this program will be explained in the following table and discussion:width of the table is not enough to be written in half a page, it can be written a full page. The title of the table is written from left to right, all words are capitalized, except for conjunctions.

A flowchart is a chart with certain symbols that describe the sequence of processes in detail and the relationship between a process and other processes in a program. Here is the Flowchart of the Image Identification program:

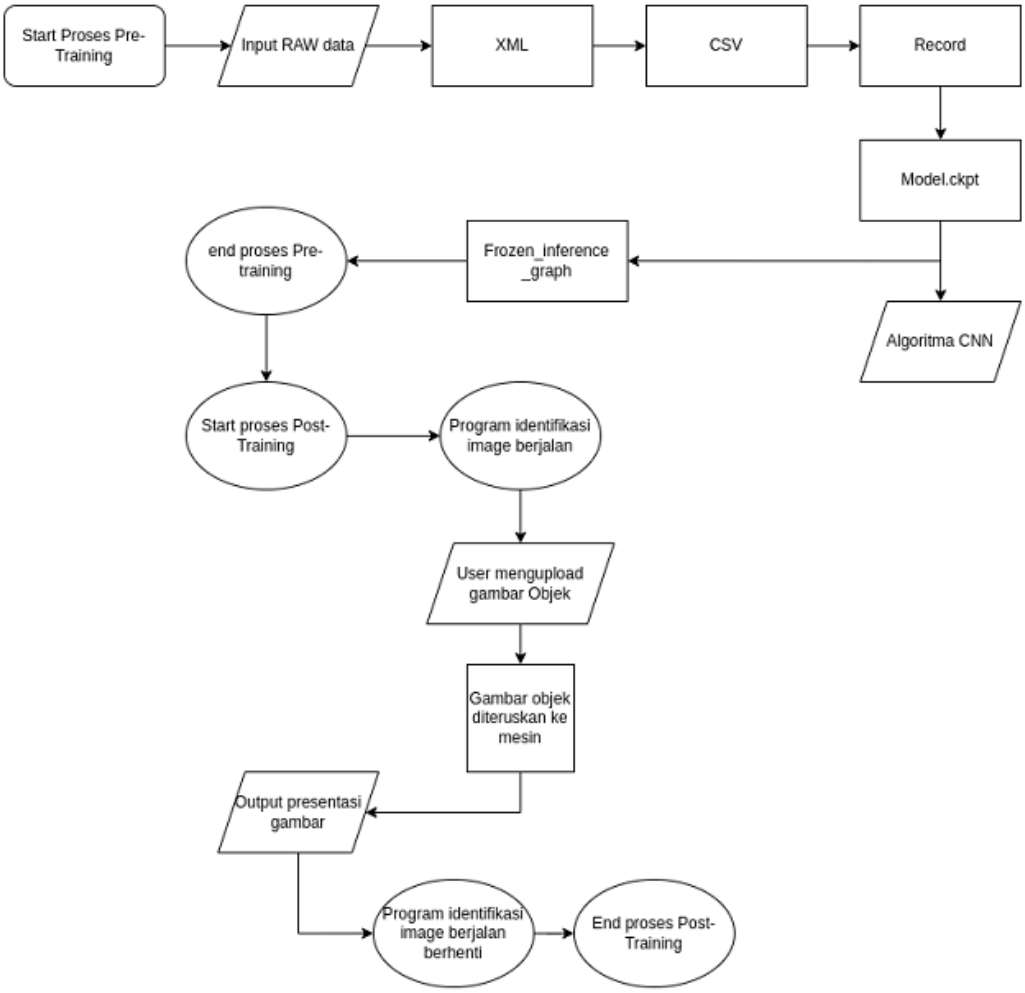

Figure 1. Flowchart Diagrams

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Tabel 1. Program Design Specifications

Directory name	Function	Media
TensorFlow Model Research Object Detection	As a directory to store a file from the CNN algorithm, the Input Form Specification directory, the training directory, the data directory, and the images directory.	Nautilus file manager
Training	As a directory to store Checkpoint training pbtxt files, and tensorboard graph loss functions	Nautilus file manager
Images	As a directory to store image files that will be trained by the machine and contains the test and train folders there is also an xml file	Nautilus file manager

Black box testing is carried out to determine whether an input can describe the right process and produce an output that is in accordance with the design. The following is a black box testing test table.

Tabel 2. BlackBox Testing

Scenario	Test Case	Expected results	Description
Image Input Process	Showing Image Input Process	Show home	Succeed
Item Image Recognition With Machine Learning	Show identification process	Identification process	Succeed
Animal Drawing Recognition With Machine Learning	Showing the Identification Process	Identification process	Succeed

From the test results above, the results obtained by using machine learning to determine the image is correct, the display below is obtained.

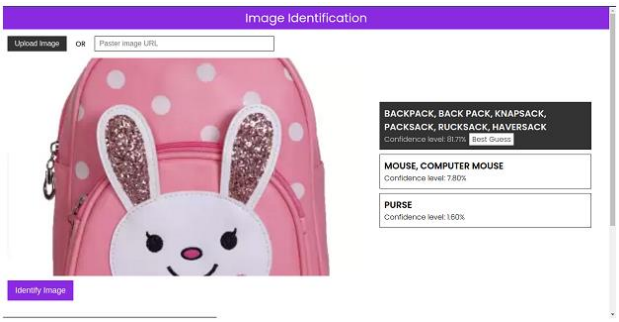

Figure 2. Bag Image Identification

When inputting a bag image, the program will process and identify the image. The display above shows that the computer recognizes that 81.7% of the images are bags. Likewise with the image below. The computer can identify 96.83% of the image is a crocodile animal.

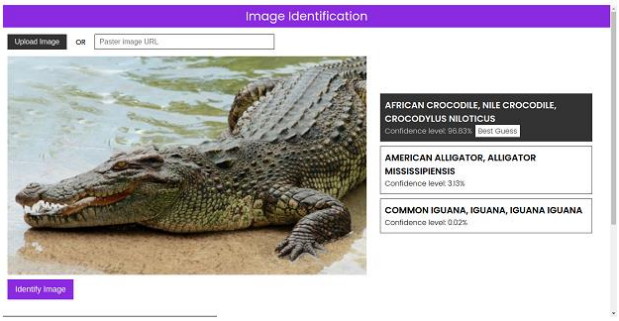

Figure 3. Crocodile Image Identification

IV. Conclusion

Based on the discussion and testing of the Image Identification Program, it can be concluded that Machine Learning provides artificial intelligence that has the ability to learn without being programmed. Then the data set that is not good can result in inaccuracies in detecting an object. And lastly, that the lighting situation, the quality of the camera device, and the angle of shooting play an important role in increasing the value of accuracy in recognizing an object.

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