A Review on Democratization of Machine Learning In Cloud

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***Abstract*— This paper gives you detailed information about the use of autonomous policy in machine learning so that the use of democratization may easily direct to "Cloud based open-source machine learning APIs". By going through this paper you'll able to learn how we can use "Democratization of Machine Leaning in Cloud" for the development of benefit of Women.**

Keywords: Democratization, ML, APIs, Cloud, AI

I. INTRODUCTION

The name Machine Learning came into subsistence by Arthur Samuel in 1959. According to him, "Machine learning is the ground of study that gives computers the capability to learn without being unambiguous programmed."

By Tom Mitchell, "The field of Machine Learning is apprehensive with the question of how to construct computer programs that automatically progress with experience."

Machine Learning was once something that only large companies or organizations could invest because these organisations can afford programmers and data scientists for construction complex machine learning frameworks. Companies like Google, Amazon and Netflix were among the few who had used their assets to take advantage of machine learning. But this is no longer the case.

New tools and technologies are enabling the regular companies or organizations to take the benefit of machine learning. The idea of making amazing easy to get to to everyone is called Democratization.

Google, Apple, Facebook, Microsoft and other tech giants are on the forefront and are vigorously investing in democratization of machine learning. In the modern years, these companies have open sourced many AI/ML libraries, tools.

II. MACHINE LEARNING

Machine learning is a acquaintance that is used so that the intricate task performed by the human can be easily performed at a much superior speed and with more effectiveness .Machine learning is sub-categorized to three types: Supervised Learning – Guide Me! Unsupervised Learning – Learn from the surrounding Reinforcement Learning – My life My rules! (Hit & Trial)

Supervised learning is a learning in which a machine learns from the instruction data set. It can't take resolve on its own .It will equivalent every decision with the predefined set that has already been cache in it. In the case of unsupervised learning ,machine grasp from the environment Assume we made a Robot to perform the convinced task, say, to put the books from one table to a different but we have not distinct the scope of the room or the distance between the two tables. In this case The Robot will itself find the best promising path after deteriorating for a number of times and will primarily complete the definite task. Reinforcement learning works on either 0(failure) or 1(success). If the machine chooses a exact option it will be measured as success or vice versa.

Democratization of machine learning means giving gain of machine learning to regular people also .As Democracy merely means for the people, to the people and by the people.

This means they will bring assistance in favor of themselves. Democratization of machine learning in Cloud will give them adequate storage to bring their thoughts into action as most of the people can't afford it. APIs (Application Programming Interface)-It is a software that allows communication between two applications. It serves as the interface or medium between the applications to exchange the useful information. In technical terms, It is a set of function definitions, protocols and various tools that are needed to build a software

In this paper we are going to explain few machine learning tools that have been recently released for AI start-ups, developers, and researchers.

These are as follows:

I. Tensor Flow Object Detection API- Machine Learning systems for computer vision has been developed by Google for improving their products and services and for research community.

It is a very powerful tool that enable everyone (even those who do not belong to machine learning background) to build and deploy powerful image recognition software. The functionality of Object Detection API comes with the Mobile Nets single shot detector optimized to run on mobile devices. It has been designed for the limited computational and power resources of smart phones.

Mobile Nets makes it easier for mobile developers to integrate the machine learning functionality into their mobile applications .Anyone who wants to use AI/ML functionality in their desktop, Object Detection API provides a heavy duty inception based CNN (convolution Neural Network) that is optimized for heavy data processing. In both cases Object Detection API makes it easier to integrate image recognition functionality into their software.

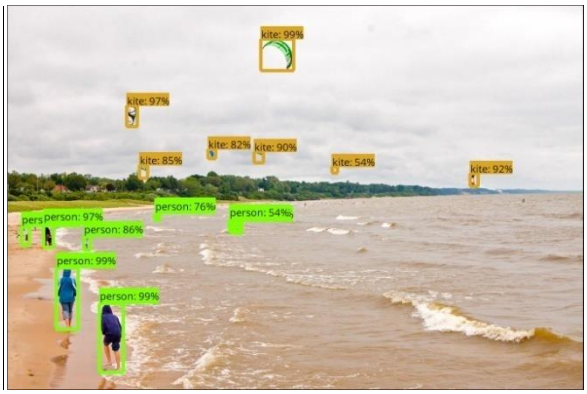

Fig 1. Illustration of Tensor Flow Detection API

III. GOOGLE'S CLOUD VIDEO INTELLIGENCE API

The video Intelligence API allows developers to figure out what videos are about and detecting objects within them. Many similar image recognition APIs are available focusing only on images. But with the help of this API, developers can search and discover information in videos. This means we can search for "apple" or "cat" or "flower" or anything in the video. Besides this, the API helps us to tag scene changes in a video but those videos have to be stored in Google's cloud storage service. Cloud Video Intelligence has been improving over the time as new concepts are introducing and accuracy has been improving. We can search our video catalog in the same way as we search for the text document. Cloud Video Intelligence extracts metadata that can be used index the content of our video. We can identify the signal mixed with noise, by using shot detection to distinguish scene changes within a video and discern only relevant entities at the video, shot or frame level. Since Video Intelligence API is provided as a REST service, there is no need to download any library or software. We just only need to do registration on the Google Cloud Platform and begin using Video Intelligence API via the standard cloud pay-as-you-go scheme. This API is majorly used in the videos of large duration. For example (fig 2), Now-a-days people uses CCTVs to protect themselves and/or to see what was happening in their absence. So if they want to search a man having a black cap, they can simply search this with the use of this API that will help in saving their time.
Intelligence and Accuracy have been improving.

Fig 2. Depicting Video Intelligence API

IV. APPLE'S CORE MACHINE LEARNING

In June 2017, Apple released its Core Machine Learning API that has come with ios11 designed to make AI faster on its iPhones, iPad, and Apple Watch products. This API includes most of the machine learning operations such as image and face recognition, object detection, natural language processing (NPL).It supports a variety of machine learning models including neural (deep, convolution recurrent),linear models and decision trees . Core machine learning model format (models with all model file extension). The Core Machine learning model has been used to integrate machine learning models into the app. A trained model is the combination of machine learning algorithm and set of training data. This model makes predictions based on the input data. For example when the number of bedrooms and bathrooms are provided as the input, this model predicts the house prices.

Fig 3. Apple's Core Machine Learning

V. AMAZON POLLY

It is a service released in November 2016 as a part of AWS(Amazon Web Services) artificial intelligence suite to convert text into speech. It uses deep learning technology that allow applications to speak with a human like voice. This system supports 24 languages and multiple voices. We just only need to upload the text into the AWS console, select one of 24 languages (of our choice) and customize pronunciation and download audio files from the cloud to our local machine.
Amazon Polly has many applications. It is used by Go Animate users to immediately give voice to the characters they animate using this platform. It has also been used by a website named duo lingo where accurate pronunciation is more important than when we're learning a new language.

VI. MICROSOFT EMOTION API

This API has been provided as a part of Microsoft Azure Cloud Services. This API recognizes human emotions in images and videos. This API recognizes human expressions in an image and returns a face identification boundary box. It detects happiness, sadness, surprise, anger, fear, contempt, and disgust. It returns emotions of a number of faces in a video over a period of time. The Emotion API uses JSON for data exchange and API keys for authentication.

Fig 5 .Detecting Emotion via Azure

To start using Microsoft's tool, we need to send a POST or GET request to specified URLs and a detailed description in JSON as a result in response. Microsoft offers an SDK(Software development kit) which is integrated with our application. The API can do 30,000 transactions with the images and 300 operations with the videos per month.

VII. APACHE SPARK

It is a powerful open source processing engine which is easy to use with various API's written in java ,python,R, Scala and Sql . E-commerce companies like Alibaba , Social Networking companies like Tecent and Chines search engine Baidu, all runs on apache spark engine.
Spark is a general purpose computing engine that allows you to run batch interactive and streaming jobs on the cluster using same unified frame.
To understand the working of spark you have to understand three big concepts:

First is RDD (Resilient Distributed Data Sets)- It is the representation of data that coming into your system in an object form and allow you to do computations on it .RDD are resilient because they rely on lineage whenever there is failure in the system they can recompute themselves using the prior Information using lineage .

Second concept is transformation-It is what you do to RDD to get other resultant RDD .Example of transformation is opening file and creating RDD or doing function like filter that would then create other resultant RDD. Third concept is actions. It is when you are asking for an answer that system needs to provide you.
The interesting thing about spark is that it does lazy evaluation means RDD are not loaded or pushed into system when the system encounter RDD they are only done when the action to be performed.

VIII. BENEFITS

a) Fault Recovery
b) Optimized
c) Easy Programming
d) Rich Library Support (ML, Graphics)

IX. CONCLUSION

Life style of people are changing and not only the life style their attribute towards the lifestyle is also changing which encourage Women for their further education using latest technologies. To understand the ability and use of technology can have positive impact on Women's freedom, education and employment. There is large population so that they want to invest less time and get maximum returns. Artificial intelligence, Machine learning or Neural Network is a technique to make things smart.

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