**\*Please make a copy of this document and include this in your GitHub repository for your submission, using the tag #AndroidDevChallenge\***

**Tell us what your idea is.**

*Describe in 250 words what the feature or service will do and how you’ll use Machine Learning to push the bar:*

The idea is to build a machine learning model using TensorFlow lite in an android app to detect sickle cell and malaria in the blood sample of patients.

I want to help reduce the time it takes to detect these diseases with high accuracy leveraging on the power of on device machine learning.

Currently, to diagnose sickle cell disease, blood samples are sent to a diagnosing laboratory for testing to detect sickle and parasitized cell for (sickle cell disease and malaria) respectively, then, the test result is sent back to the health center.

My focus is to bring about real time detection of sickle cell and malaria disease in the blood sample of patients right there in the health center.

There have been recent developments in this area, but it requires sophisticated equipment attached to the mobile device.

Using convolutional neural network, I plan to train my model with different images of sickle cell disease and parasitized cell.

TensorFlow for poet’s code base will be used to train the model and google code-labs will be used to speed up the development process.

Training a Machine learning model to recognize these diseases will bring a new era for quick and early detection of the disease especially for Africa where I live.

The idea is unique because this model will be installed in an android app and can be used by health centers in remote places in Africa will no connection to the internet.

**Tell us how you plan on bringing it to life.**

1. Currently I have completed my proof of concept using a smaller popular dataset from the National library of medicine (malaria) and the American Society of Hematology (sickle cell), the dataset was trained with TensorFlow for poet’s code-labs.

To demonstrate my idea for image classification I created a demo app for the trained model.

I have read several research papers and have contacted research institutes for their dataset—

1. NIH, 2. Orphanet, 3. American Sickle Cell Anemia Association, 4. Mayo Clinic and also individual researchers from Cameroon who wrote a paper titled “Automated Diagnosis of Malaria in Tropical Areas Using 40X Microscopic Images of Blood Smears”. I am passionate and fully committed to using machine learning to help solve the health disease.

1. List of ways Google can help:
2. Access to mentors to get mentorship from
3. Access to relevant data
4. Access to the latest research in image classification for improved accuracy
5. Help in spreading the technology to the health center in Africa, Asia and the world at large.
6. Expertise on medical best practice since this is to detect disease.
7. I have been working with TensorFlow for poets to build my model and I would want to improve on this approach.
8. TimeLine:

November 30, 2019

1. I have completed my proof of concept

December 15, 2019

1. Work on the best possible method for the application, such as user interface
2. Documenting and Training models
3. Work on Application Development and UI/UX design

Early-mid Jan 2020

1. Obtain necessary data and cleaning, the most extensive dataset used in this project so far is from the American society of Hematology, hopefully I will get a feedback from them shortly.
2. Gathering feedback, fixing bugs and logic errors.
3. Data preprocessing

End of Jan 2020

1. Finish data preprocessing
2. Have full dataset ready
3. Finish training data and testing model with TensorFlow to improve accuracy and have it deployed to the next application version.
4. Publish the app to people to get feedback.

Early-mid Feb 2020

1. Attend Google’s technical expertise bootcamp, network with participants and engineers, and gain valuable knowledge that will lead to the success of the project.
2. Get help in places where I had roadblocks/issues, make optimization and ensure that the system does not breakdown

Mid-Late Feb 2020 & Early March 2020

1. Implement the feedbacks gotten from mentors and people to make the model flexible
2. Work on TensorFlow object counting api for the annotated images

March 2020

1. Release closed alpha application version
2. Gather feedbacks from people, implement everything I need to implement, fix bugs
3. Work on making sure that this is viable as a product by meeting regulatory guidelines

April 2020

1. Release open beta application version
2. Get feedbacks from people and the medical practitioners and implement feature request and fixes.

May 2020

Showcase my idea to the world.

Future Plans

Modify the android application to perform object countering using TensorFlow Object counting Api

**Tell us about you.**

A great idea is just one part of the equation; we also want to learn a bit more about you. Share with us some of your other projects so we can get an idea of how we can assist you with your project.

Hello,

My name is Olaonipekun Olanrewaju. I am an undergraduate student of Physics at Lagos State University, Lagos state, Nigeria and currently in my 2nd (penultimate) year in the university.

I am passionate about learning new things. I started building machine learning models by watching YouTube videos, the next step was learning from blogs post (TensorFlow) documentation are self-explanatory, then I learnt about Neural networks, and all these were from the internet.

I have used TensorFlow for poets to train my machine learning model.

I want to solve real world problems and make the solutions available to all. Keeping this in mind I would like to open source the project for the community.

I have worked on skin cancer image classification and built an android app for it

GitHub link: <https://github.com/Olaislord/Skin-Cancer-Image-Classification-Android>