

AI4D-Lab Tanzania - Workshop



Demonstration : OpticAI

Zephania Reuben

Co-Founder : **TELESOFT AI** & **NILEAGI**

August 10, 2022



Introduction



- **Diabetes**(Diabetes Mellitus) is the group of diseases that affect how our bodies control/ use blood sugar/ glucose.
- People with diabetes face some **challenges** as diabetes comes with many **complications**.



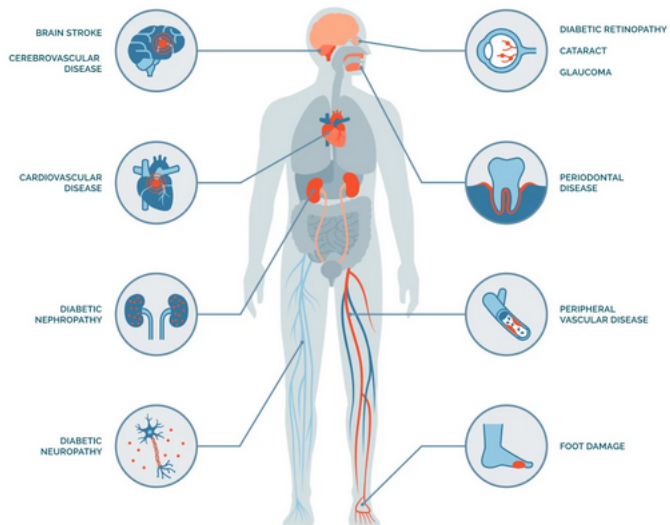
Introduction



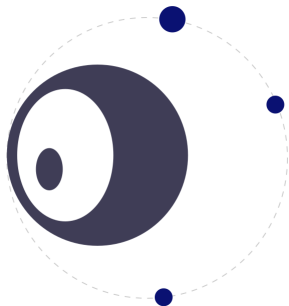
- Among the complications that come with diabetes are **cardiovascular disease, nerve damage, kidney damage, skin condition, foot damage, hearing impairments, depression, Alzheimer's disease, diabetic retinopathy** and many more.



Introduction



Introduction



- **Diabetic retinopathy** is a complication of diabetes, caused by high blood sugar levels damaging the back of the eye (retina). It can cause blindness if left undiagnosed and untreated ([source](#)).



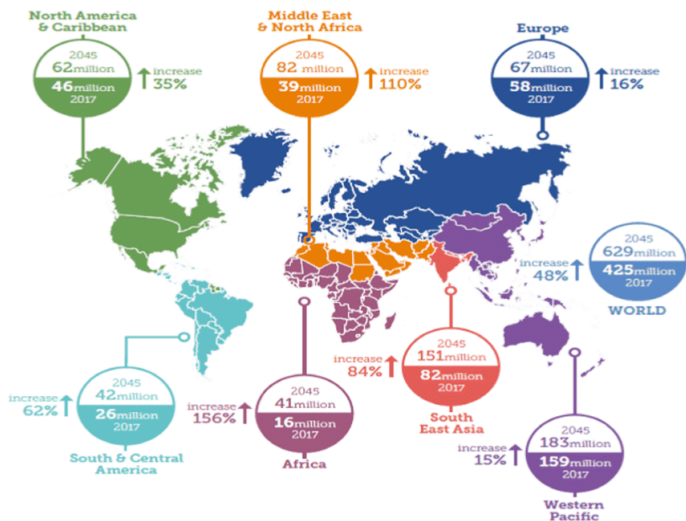
Introduction



- Diabetic retinopathy can occur **without symptoms** and can cause vision problems that can **not be corrected** by a lens and can even cause **blindness** at the late stage, but also is curable at its early stages/ (proliferative). So people with diabetes needed to take a **regular screening** of their eyes to assess the development of the disease.



Statistics on Diabetic Retinopathy



Statistics on Diabetic Retinopathy

- According to WHO, about **422 million** people on the earth have diabetes, in **sub - Saharan Africa** about **41 million** people will be suffering from diabetes by **2045**, which will increase the people in risk of Diabetic Retinopathy (**source**).



Statistics on Diabetic Retinopathy

- As the number of **people with diabetes increases**, also the **number of people with diabetic retinopathy increases** as well as the number of patients that need regular screening increases, on the other hand the problem of **shortage of doctors for performing screening arises**.
- For Tanzania alone there are **0.8:1 million** ophthalmologists per Tanzania population ratio according to (**CCBRT**) so if there is another way to screen the diabetic retinopathy it may help a lot.



About OpticAI

- An Artificial Intelligent tool that could solve the issue of doctors shortage. We have used the same kind of **Machine Learning** techniques that helps us organise our photos or tag our friends on social media, namely, **image recognition**.
- In Image recognition, the model is trained using tagged/labeled images, after looking for thousands of examples the model learns to identify the new images without any human help.
- For this Retinopathy project, we used **retina fundus** images which are graded by doctors on a scale of **1 to 5** which is healthy to decrease, we trained a Machine Learning algorithm that is able to predict an eye image that shows the sign of disease.



What is OpticAI?

OpticAI is an intelligent tool built by NileAGI for Diabetic Retinopathy diagnosis to help millions of people from blindness by making early detection.



How it works

- The doctors will be taking the pictures of the patient's **back part of the eye**, one for the left eye and one for the right eye, and then the images are **uploaded to the system**, and then the model in the system will perform an analysis and send the results back to the system interface along with the referral recommendation including further procedures.



How it works

- Currently, the diagnosis takes **months**, where it becomes hard to earlier detect the **blindness possibilities**. With the help of this technology the process will be fast within a few seconds and patients can get early treatment.
- Routine eye exam can spot the problem early in rural or remote areas thus this AI system can step in and be that early detection system. With the current context where there is doctor scarcity, **OpticAI** can help to make the diagnosis faster.



OpticAI demonstration is now available at:
<http://82.180.133.118:8000/opticai-demo>



Limitations & Discussion

- Try testing the tool with several images from your gallery, different from the sample images.
 - 1 What can you tell about the the **model's predictions**?
 - 2 If you did find a **discrepancy**, what **technical reasons** could you give for why this occurred?



Brief about NileAGI

- NileAGI is an AI research based company leading to solving intelligence toward Artificial General Intelligence(AGI).



Current Works/Researches

- **OpticAI** : This is an intelligent tool built by NileAGI for Diabetic Retinopathy diagnosis to help millions of people from blindness by making early detection.
- **Rafiki**: This a the multilingual general purpose language model with strong capabilities in speech recognition, text, voice and source code generation, multi-step reasoning and can understand human intent and have a conversation.
- **Nia**: NileAGI analytics is the tool that help analyzing and getting quantitative and qualitative insights from data for business applications and other different applications.
- **Reflex**: This is an end to end lightweight driver assistant system to make driving simple, fun and cool.



Let's connect

For more details visit [NileAGI](#) or emails us at info@nileagi.com



