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Googles AI Scans Iris to Predict Health Risk Factors

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Abstract: Looking at the iris of the eye, researchers from Google have invented a trendy method to know a person's risk of heart disease through deep learning. By taking scans of a participant's eye, the algorithm predicts accurately, involving many risk factors. It also determines the aspect of whether the person would be affected in future by any cardiac attack or heart disease. Even without human interference it gives more efficiency and rapid results. This information gathered has retinal data and also other medical information. With deep learning analysis, the neural networks are used to mine the gathered information, to know the risk factors. It sounds different to predict risk with Artificial Intelligence. Google took it as a challenge to develop it and still working hard to provide better outcomes out of it. Google did not try to improve the existing tools of medical society but tried to invent a diagnostic tool makes medical insight higher.

Keywords: Artificial Intelligence, Deep learning, Machine Learning, Fundus;

I. INTRODUCTION

Google in their recent paper, on nature biomedical engineering, took a number of publicly available pictures from UK and US and used a computer to analyse the pictures, mainly focused on the cardiovascular risk factor. If you know medicine, you might be knowing that a lot can be derived on seeing a patient's retina. For example, we can determine about the blood pressure by seeing their blood vessels. Google researchers took images of patients from diabetic retinopathy screening and focused the search based on parameters like gender, age and smoking status. These parameters were used to find if they were related to cardiovascular risk. And the outcome was that, based only on the images, the computer predicted few risk factors like gender, age and blood pressure. The interesting part is that on comparison, the results of the computer were relatively accurate with that of the traditional model.

Well, what is the use of this method?!

At present we might not stop going to our doctor to tests ourselves but it shows how computers are able to analyse pictures and get information.

II. HOW IT WORKS

A researcher, from University of Adelaide, named Luke Oakden Rayner, specialist in machine learning says how AI can improve the present diagnostic tools. Machine learning, being used by scientists, to train the algorithms and analyze a medical case of approximately 300,000 patients. The fundus reflects the overall health, using the blood vessels. Through study under the microscope, individual's blood pressure, age, smoking habits, can be inferred which are important factors for cardiovascular health. This new algorithm by Google was 70% accurate when compared with the traditional 'SCORE' blood test which has a 72% success rate. The technologies like Deep Neural Networks (a part of Machine Learning), Artificial Intelligence and Deep Learning are key concepts for this new algorithm.

III. PROCEDURE

A. Know the Patient

Two datasets are required to know the participant details i.e., UK Biobank and Eye PACS. The initial data set handled with the observational study where the participants with age approximately around 40-69 in the years 2006-10. Now, the participants who are selected should undergo certain medical examinations and some questionnaires. Consider an example of smoking versus non-smoking, they allow the individuals to differentiate themselves if they smoke or not. Then they put some questionnaires to the participants i.e. from how long a person is smoking, if he stopped or is continuing, based on these observations they are divided into separate sets and it looks for common medical conditions for each set. The average of the samples collected is used to define a participant.

Now, it's the turn of EyePACS data set which is generally used to get information about our eye retina using various camera skills which uses 45 degrees field of view. The collected information is now used for separating a diabetic patient from non-diabetic,

smokers from non-smokers and to even know the chances of heart diseases that can occur in future. The eye images of patients will have all the information about the nerves that are connected to our heart. On seeing, the doctors or analyzers can easily understand the nerves of our retina and determine if we will be affected in the future (by any heart diseases, blood pressure, smoking, diabetic, body mass index), based on the averages drawn from the above information.

Using the above datasets, the total information about the patient is available to undergo other procedures for more accuracy.

B. Designing the Model

As we discussed earlier that we use the deep learning mechanism for the neural networks that are connected to our eye. It is generally used by millions of mathematical parameters in the operational functions which increases its complexity, generally 20-22 million parameters are required. We have datasets that determine the validation of the datasets (tuning dataset), have random values to edit in future (training dataset). We therefore design a model that accepts all the conditions and make the functioning more efficient.

C. Performance of the Model

It describes about how algorithm performs with the model designed for binary and multicast classification. The photographs with less clarity are deleted from the set to increase the efficiency.

D. Statistical Conclusion

As the theory does not lead to the exact accuracy of the model designs, graphs and other statistical conclusions are used to generalize the results from the model designed for efficient understanding of the content in work.

E. Availability(code)

Code availability determines the algorithm used for the deep neural machine learning so as to provide outputs to the computers.

F. Availability(data)

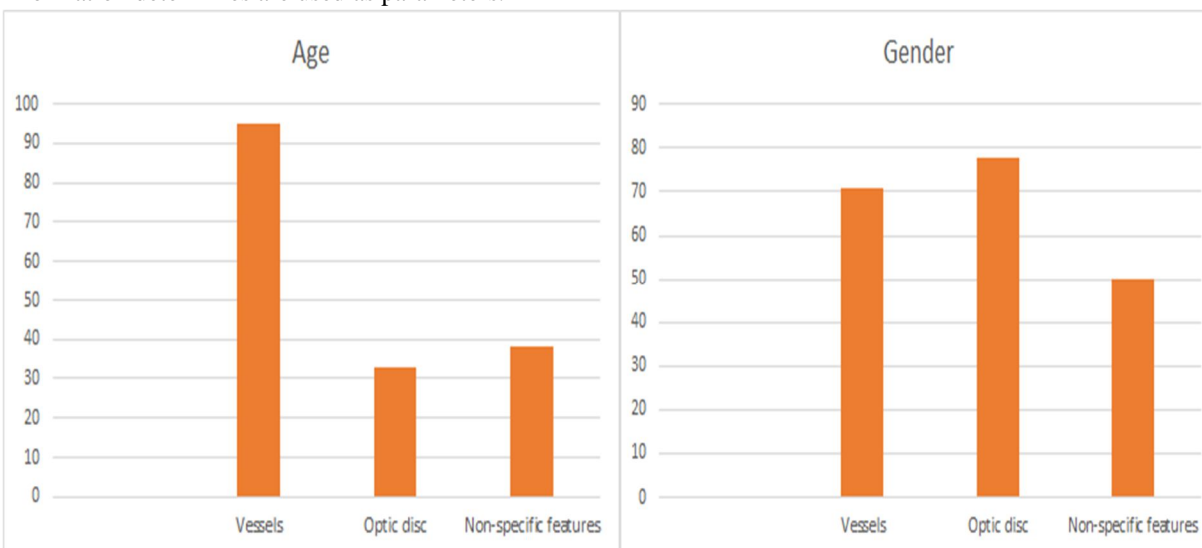
The information gathered in know the participants is used in this procedure for having all the data together.

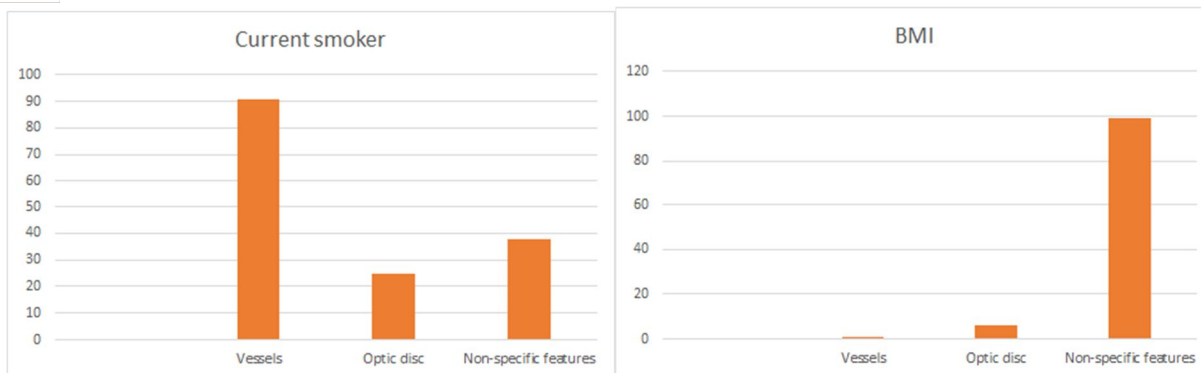
G. Summary

Further any information would be clearer in Life Sciences to report summary of the procedure that is done on this research.

IV. STATISTICAL ANALYSIS

The below graphs will help us understand how we can determine a person's age, gender, BMI, current smoker. It is done by analyzing the nerve vessels attached to our fundus (the color, shape(bulge)), optic disk which is also called optic nerve head is a part of eye where the ganglion cell axons leave the eye and the last non-specific features are those by common medical examinations what the information determines are used as parameters.





V. CONCLUSION

The results obtained from this method are almost accurate as those of the blood test and the whole process is pain free. This takes medical society to next level of heights. The process is simpler when compared to the traditional method and the complexity of handling the blood samples is no longer present. It not only gives information about cardiac diseases but also about many other abnormalities like skin cancer, hypertension, diabetes. Research is still being done in this field and new the technologies like AI is being implemented to get fruitful results which can replace the traditional methods.

REFERENCES

- [1] <https://www.theverge.com/2018/2/19/17027902/google-verily-ai-algorithm-eye-scan-heart-disease-cardiovascular-risk>
- [2] https://www.nature.com/articles/s41551-018-0195-0.epdf?referrer_access_token=KK1TVqw0CFiyzfshrLbXvtRgN0jAjWel9jnR3ZoTv0OMsbBDq-7d5VZef-dAA8S42ksrZ1vBZ3WBQt5pZ416cy7NQGq1FbJJy0uOTxIoC3CU8nn8fmT-RTRVz8SORPFLm0cYdoImE_dKVIAFZ7b8nkt2psCXq84UXbc6hD3LdmhhYeg_IXJ76pHskPiwglJrfb2pbHKNRbxLRTEINROEArNZz-Zp76_1cHbFgJzp1HhWNUFkYxagCGJWQ6kjPf5ud3trJcBi22hUO68TmlA7osVq8A2LsWQMJKfhEvgUnuvkuSWUvAgk-WJbqk6-IJR&tracking_referrer=www.theverge.com
- [3] <http://fortune.com/2018/02/21/google-heart-disease-ai/>
- [4] <https://www.youtube.com/watch?v=i9g-oGhr05k>
- [5] https://www.washingtonpost.com/news/the-switch/wp/2018/02/19/google-used-artificial-intelligence-to-predict-heart-attacks-with-the-human-eye/?noredirect=on&utm_term=.4aa88cb69d77
- [6] <https://machinelearningmastery.com/what-is-deep-learning/>
- [7] https://www.doc.ic.ac.uk/~nd/surprise_96/journal/vol4/cs11/report.html



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