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AUTOMATED DIABETIC RETINOPATHY DETECTION USING DEEP NEURAL NETWORK

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ABSTRACT

Diabetic retinopathy(DR) is a disease that occurs in patients with long period history of diabetes. It happens when high levels of blood sugar damage blood vessels in a part of the eye called the retina. This eye disease starts out with only mild vision problems such as blurriness, however the ignorance of diabetic retinopathy will eventually lead to blindness and it is the most common eye disease among people with diabetes. The diagnosis of DR currently using typical retinal fundus photography that requires and depends on skilled reader for the manual DR assessment. However, this method opens to the inconsistency of the diagnose. Thus, Automated Diabetic Retinopathy Detection aims to reduce the burden on ophthalmologists and mitigate diagnostic inconsistencies between manual readers by classifying DR stages using previous DR images with stages labels using Deep Neural Network.

OBJECTIVES

- To construct diabetic retinopathy into image model
- To develop an interface for detecting the diabetic retinopathy of patience
- To evaluate and test the constructed model
- To improve the model's performance

METHODOLOGY
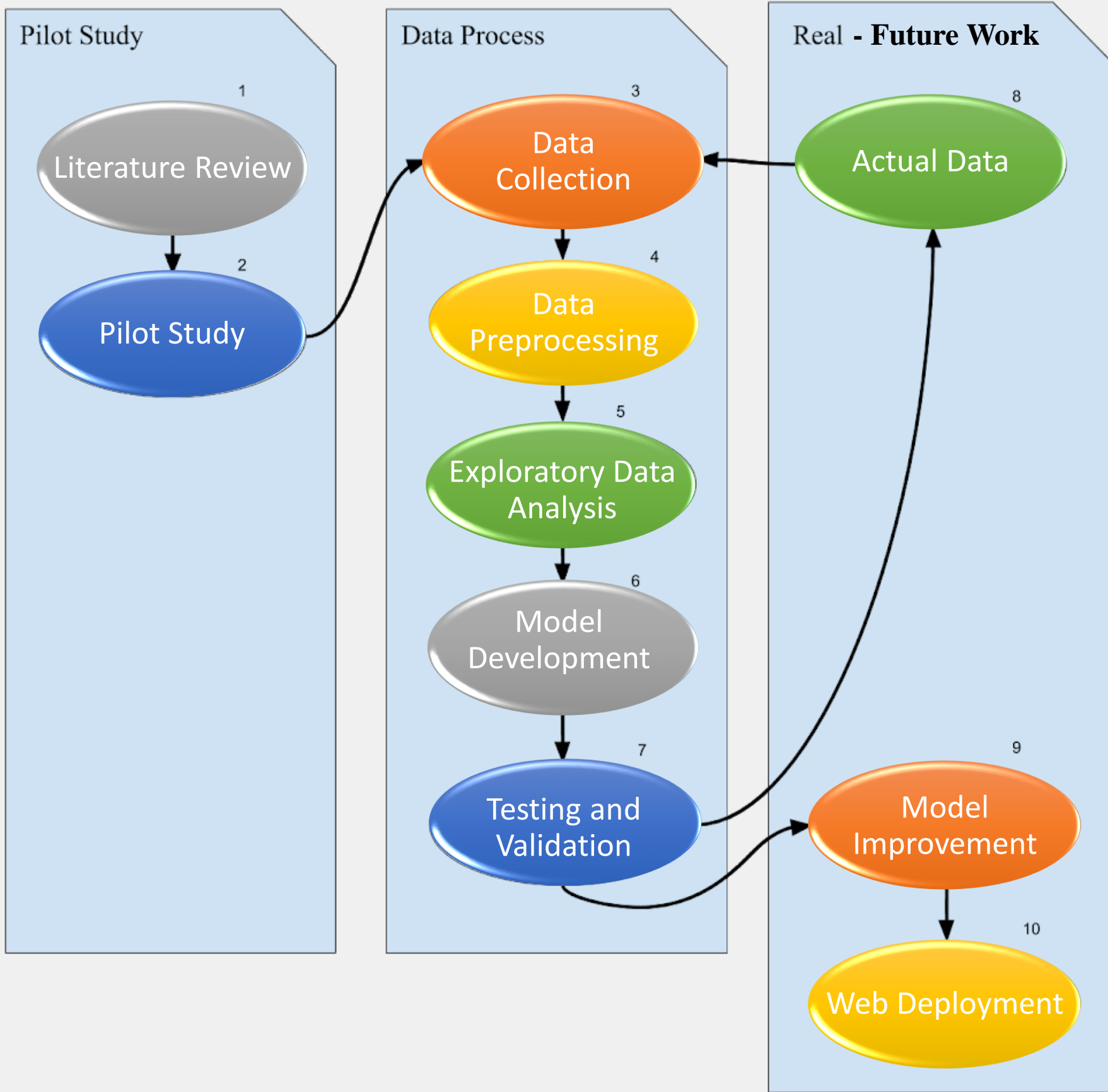
PREVIOUS WORKS

SYSTEM	Algorithm & Strength	OUTCOME
DR-RACS	Amplitude modulation-frequency modulation(AM-FM), k-means & partial least square classifier	Low risk / high risk for DR
Retmarker DR	Longitudinal analysis by comparing with baseline image	Presence/Absence of DR : microaneurysm turnover
Singapore Eye Lesion Analyzer (SELENA)	Deep learning technology using CNN and region extraction	Grade of DR and referable / nonreferable

OUTCOME & RESULT

D-CNN Retina

Please insert Retinal image here

Choose File   10_left.jpeg   Predict

PREDICTIONS
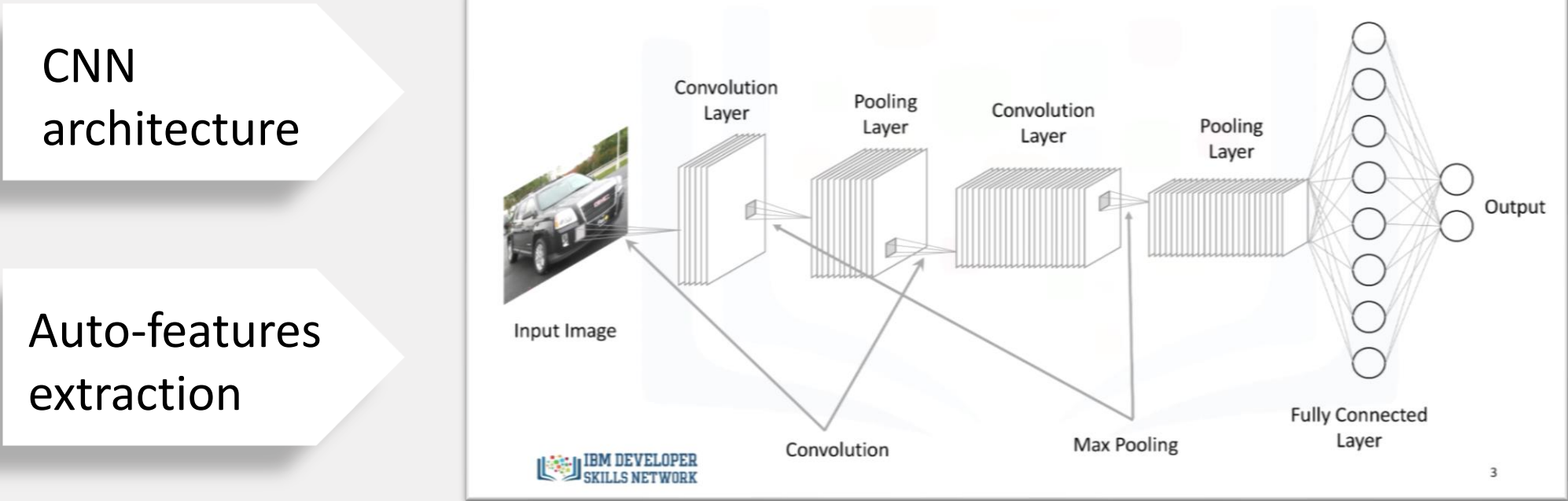
Normal: 0.645578
Mild: 0.020725
Moderate: 0.266553
Severe: 0.014657
Proliferative: 0.052487

RESULT: Normal

github.com/muhdlaziem

- Classification prediction
- 74% accuracy
- 2 Convolutional layers
- 2 max pooling layers
- 1 fully-connected layer

- CNN architecture
- Auto-features extraction

TOOLS

REFERENCES

Barsegian, A., Kotlyar, B., Lee, J., Salifu, M. O., & McFarlane, S. I. (2017). Diabetic Retinopathy: Focus on Minority Populations. *International journal of clinical endocrinology and metabolism*, *3*(1), 034.

Carson Lam, D. Y., Guo, M., & Lindsey, T. (2018). Automated detection of diabetic retinopathy using deep learning. *AMIA Summits on Translational Science Proceedings*, *2018*, 147.

Doshi, D., Shenoy, A., Sidhpura, D., & Gharpure, P. (2017). Diabetic retinopathy detection using deep convolutional neural networks. *International Conference on Computing, Analytics and Security Trends, CAST 2016*, 261–266. https://doi.org/10.1109/CAST.2016.7914977

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