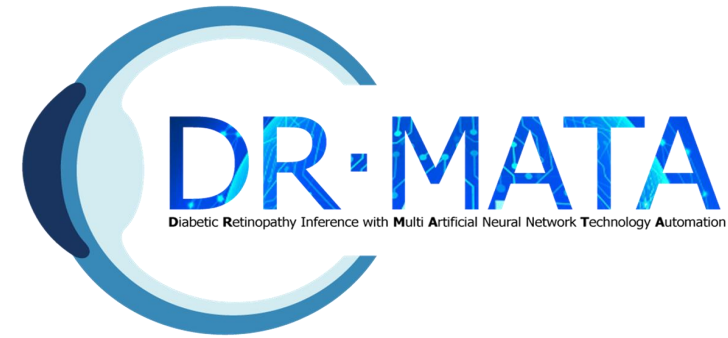




PREVENTIVE CARE FOR DIABETIC RETINOPATHY USING BIG DATA AND AI IN SCREENING

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Kementerian Kesihatan Malaysia

DR-MATA

Diabetic Retinopathy Inference with **M**ulti **A**rtificial Neural Network **T**echnology **A**utomation



DR. MATA
CORE TEAM MEMBERS

Prevalence of Diabetes

- Globally, around 463 million people had diabetes, and these numbers are expected to continue to rise.
- In Malaysia, the prevalence of diabetes has increased from 11.2% in 2011 to **15.6%** in 2023 (NHMS)

Diabetes is one of the top causes of death in Malaysia!



CLINICAL PRACTICE GUIDELINES

JUNE 2011 MOH/P/PAK/216.11(GU)

SCREENING OF DIABETIC RETINOPATHY

It has been recommended that all DM patients should have at least a yearly eye examination

However, the National Health and Morbidity Surveys (NHMS) 2015 reported that only 47% of patients with known DM ever had an eye examination

DIGITAL INNOVATIONS IN EYE CARE



GAPS IN POPULATION SCREENING

Gaps in population-level screening and management of DR, AMD and glaucoma are well known



TECHNOLOGY

Technology may provide innovative solutions to address such gaps



INNOVATIONS

Innovations that are not constrained by the need for additional infrastructure and manpower to operationalize them



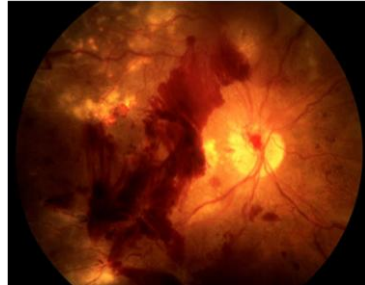
ARTIFICIAL INTELLIGENCE

AI in ophthalmology have the potential to improve the accessibility, availability, and productivity of existing resources and overall efficiency of eye care services

KEY SOURCES OF BIG DATA IN OPHTHALMOLOGY

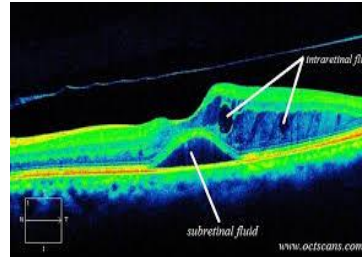


Cornea pictures

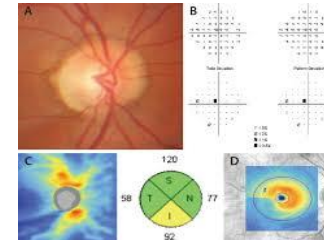


Retina Images

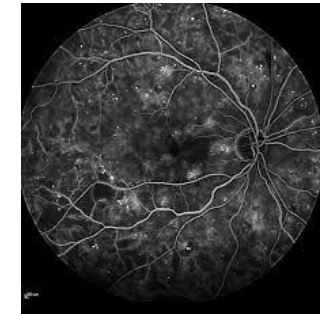
Big data for diabetic retinopathy refers to the large-scale collection and analysis of retinal images, to enhance detection, monitoring, and management of DR



Retina OCT



ONH / RNFL OCT

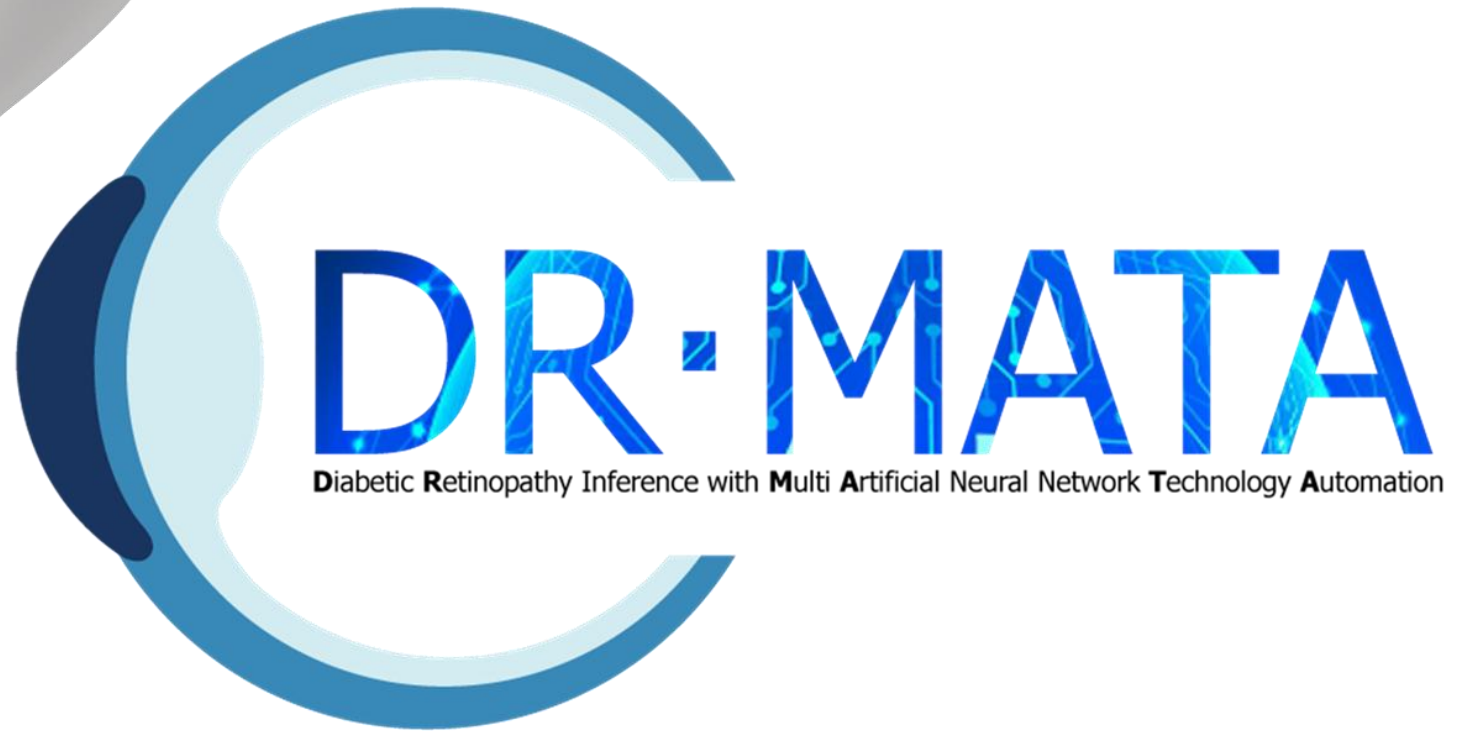


Fluorescein Angiography



*USE OF ARTIFICIAL INTELLIGENCE
(DR. MATA SYSTEM)
FOR THE DETECTION AND
INTERVENTION OF DIABETIC
RETINOPATHY*

NMRR ID: NMRR-19-2260-50173



OBJECTIVE

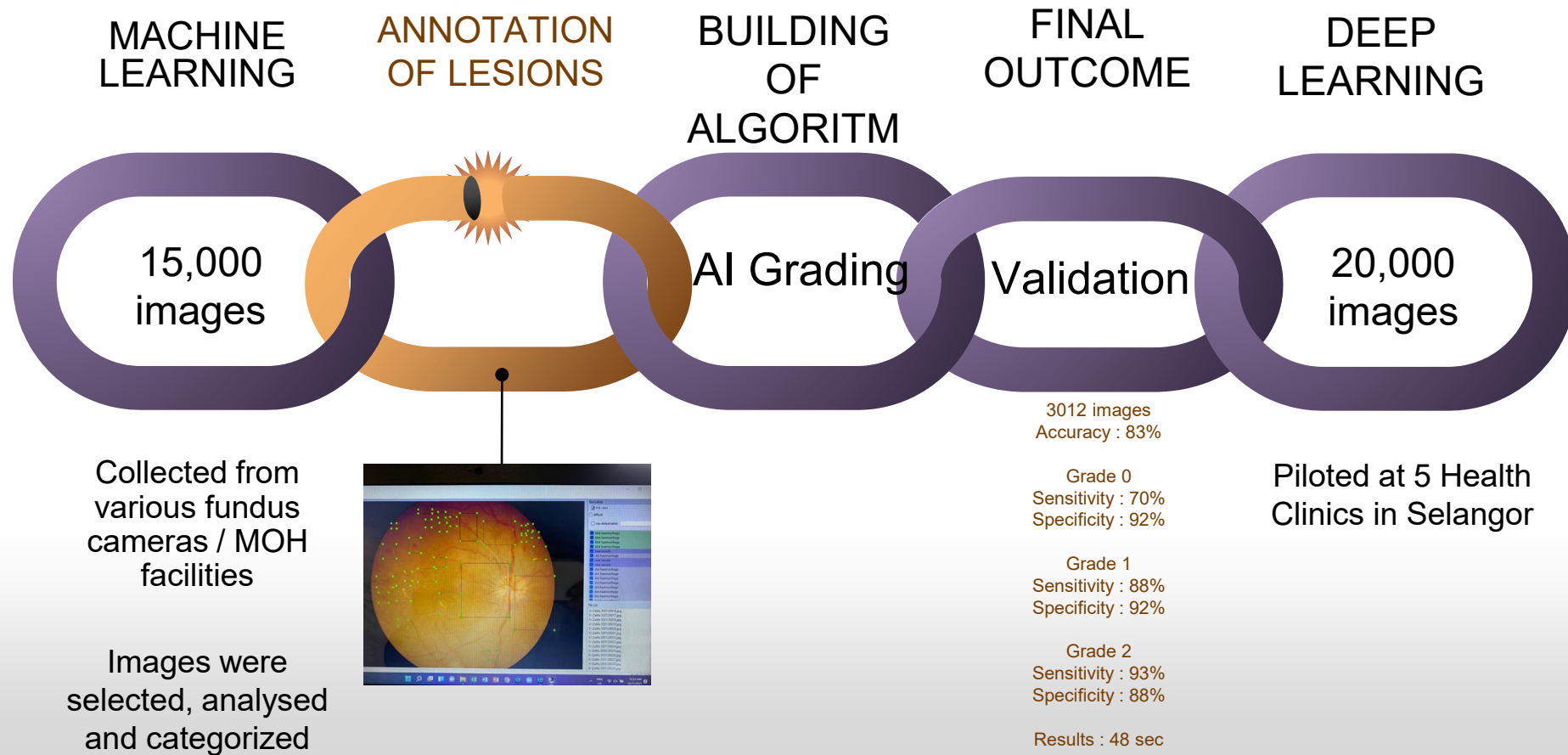
To develop an AI technology that can detect variable grades of DR

To develop an accurate AI technology that is better than what is existing in the market :

- Ability to detect DR according to its severity
- Enable digital DR identification that provide accurate diagnosis
- Allows timely referral and management
- Upgrading of the system can be done as required at an acceptable cost
- Utilising local technology in the AI development and usage of local cloud storage system

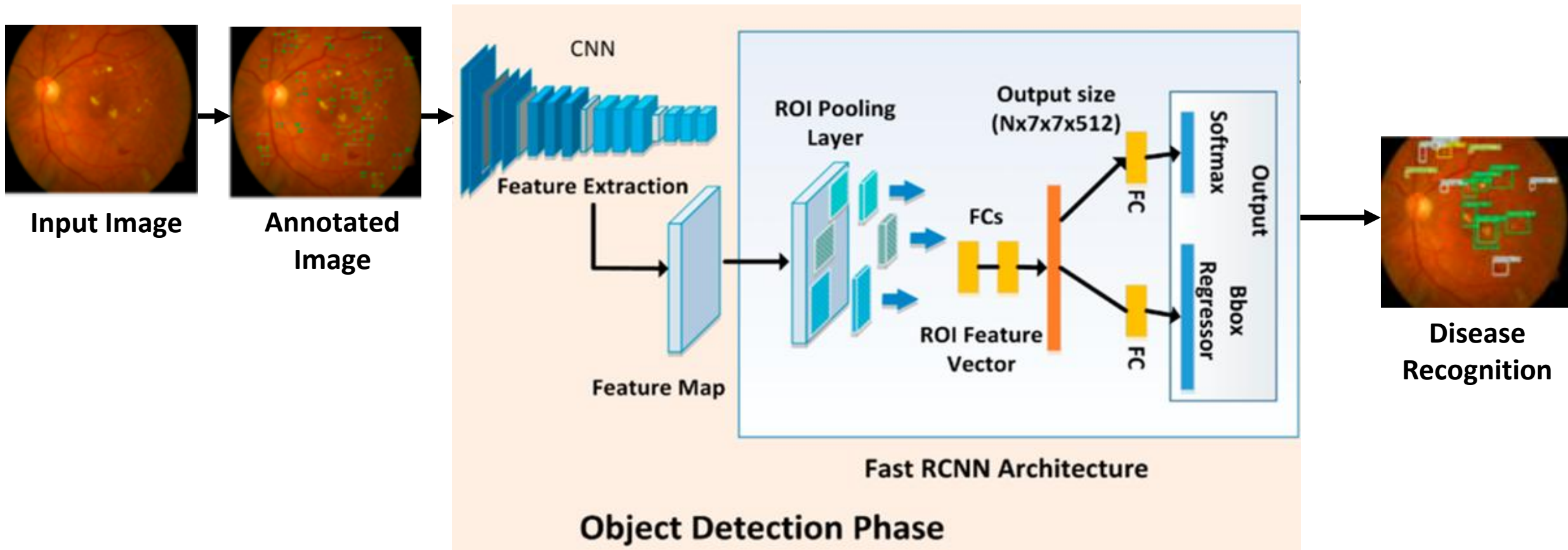
AI system from abroad:

- High maintenance cost
- As AI technology evolve very fast, the need for system upgrading is expected to be frequent, and would be costly if it comes from abroad
- Utilising cloud storage out of the country – issue of data safety and confidentiality



USE OF ARTIFICIAL INTELLIGENCE (DR. MATA SYSTEM)
FOR THE DETECTION AND INTERVENTION OF DIABETIC RETINOPATHY

NMRR ID: NMRR-19-2260-50173



Grade 0

Grade 1

Grade 2

No DR

Mild to Moderate DR

Severe NPDR, PDR and ADED

WEB PAGE - [HTTPS://WWW.DRMATA.COM.MY/](https://www.drmata.com.my/)



Early Detection, Preserving Vision

Login



Login

[Forgot Password?](#)

WEB PAGE



Hospital Cyberjaya

 Dashboard

 Retina

 Patients

 Referral

 Ask CPG

Please verify your email

 [Verify now](#)

! Grading Legend

-  Grade 0 (Normal): Repeat fundus photo within a year
-  Grade 1 (Mild to Moderate NPDR): Repeat fundus photo within 6 months
-  **Grade 2 (Severe NPDR/PDR/ADED/Maculopathy): To refer ophthalmologist**

 Refer

👁 Right Eye



Grading: **Grade 2**

Confidence: 98.1%



👁 Left Eye



Grading: **Grade 2**

Confidence: 98.6%



Grading: **Grade 2**

Confidence: 99.6%





Kementerian Kesihatan Malaysia

Referral Letter

04/08/2025

To:
Medical Officer
Ophthalmology clinic

RE: mull

Dear Doctor,

With reference to the above-mentioned patient, we are referring this patient for expert opinion and management. Patient has been detected to have the following condition based on our screening.

Eye Category	Clinical Grading	AI Grading
Right	1	Grade 2
Left	1	Grade 2

Regards,
Dr Zafra
Medical Officer
Hospital Cyberjaya

Grade 0 (Normal): Repeat fundus photo within a year

Grade 1 (Mild to Moderate NPDR): Repeat fundus photo within 6 months

Grade 2 (Severe NPDR, PDR, ADR, Maculopathy): To refer ophthalmologist



AUTO GENERATED REFERRAL LETTER

WHY DO WE NEED OUR LOCAL AI TOOL



- **Malaysia diversity - to ensure inclusivity and variability of race and multiple fundus camera model.**

- **Cost-effective**

- **Piloted in MOH primary care settings reduced specialist burden, shortened time interval screening to referral**

- **Task-shifting model- empower frontline providers to detect DR with confidence**



Our Vision

DR. MATA as part of a system-wide solution



Supporting early detection and preserving sight



Expand system capabilities



Enabling Interoperability within MOH Digital Framework



THANK YOU



DR ZALIFA ZAKIAH ASNIR, JABATAN OFTALMOLOGI
HOSPITAL CYBERJAYA



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