**PROBLEM STATEMENT**

**PROJECT TITLE:**

Deep Learning Fundus Image Analysis for Early Detection of Diabetic Retinopathy.

**TEAM MEMBERS:**

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**PROBLEM STATEMENT:**

* Diabetic Retinopathy (DR) can cause abnormal blood vessels to grow out of the retina and block fluid from draining out of the eye. This cause a type of glaucoma i.e. Vision loss and blindness .Early detection is important to prevent permanent vision loss. The most common reactions are transient nausea that occurs in 3-15% of patients, vomiting in 7% of patients.

**EXISTING DIAGNOSE METHODOLOGY:**

* The dilated eye may remain blurry for several hours.
* Time consuming task.
* Angiography is not advisable for all the patients. It is not suitable for old patients,

new born babies, pregnant women, allergic patients, heart patients and kidney

patients.

**CAUSE:**

Diabetic retinopathy is a complication of diabetes, caused by high blood sugar levels damaging the back of the eye which may lead to loss of vision permanently.

**STAGES:**

* Mild Diabetic Retinopathy-At least one micro-aneurysm present on retinal exam.
* Moderate Diabetic Retinopathy-Characterized by multiple micro-aneurysms, dot-and-blot hemorrhages.
* Severe Diabetic Retinopathy-In the most severe stage of Diabetic Retinopathy, we will find the venous bleeding, and severe intra-retinal micro-vascular abnormalities (IRMA).
* Proliferative Diabetic Retinopathy-This stage results in the vision loss.

**EFFECTS:**

Vision disorder, blurred vision, distorted vision will occur. This problem occurs commonly for Diabetic patient.

**TYPES:**

**Background Diabetic Retinopathy**

* Micro-aneurysms
* Exudate
* Deep hemorrhages

**Pre-proliferative Diabetic Retinopathy**

* Cotton wool spots
* Venous irregularities
* Dark blot hemorrhages

**Proliferative Diabetic Retinopathy**

* Presence of newly formed Blood vessels.

**OBJECTIVE:**

* To develop non-invasive alternative for Eye Angiogram.
* To detect maximum minute changes in the fundus image for early detection and diagnosis of Diabetic Retinopathy.
* To classify and grade the diabetic retinopathy using Fundus retinal scan images.