**Diabeto-Vision**



**By:**

**Mudabbir Ahmed**

**35830**

**Saad Munaf**

**38748**

**Saad bin Rizwan**

**37968**

**Supervised by:**

**Prof. Mr. Tajamul Shahzad**

**Faculty of Computing**

**Riphah International University, Islamabad**

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**Riphah International University, Islamabad**

Date: [date of final presentation]

**Final Approval**

This is to certify that we have read the report submitted by ***Mudabbir Ahmed (35830), Saad Munaf (38748), Saad bin Rizwan (37968)*** for the partial fulfillment of the requirements for the degree of the Bachelors of Science in Computer Science (BSCS). It is our judgment that this report is of sufficient standard to warrant its acceptance by Riphah International University, Islamabad for the degree of Bachelors of Science in Computer Science (BSCS).

**Committee:**

|  |  |
| --- | --- |
| **1** | Prof Tajamul Shahzad  (Supervisor) |
|  |  |
| **2** | Dr. Musharraf Ahmed  (Head of Department/chairman) |

**Declaration**

We hereby declare that this document “**Diabteo-Vision**” neither as a whole nor as a part has been copied out from any source. It is further declared that we have done this project with the accompanied report entirely on the basis of our personal efforts, under the proficient guidance of our teachers, especially our supervisor **Prof. Tajamul Shahzad**. If any part of the system is proved to be copied out from any source or found to be reproduction of any project from anywhere else, we shall stand by the consequences.

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**Mudabbir Ahmed**

**35830**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Saad Munaf**

**38748**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Saad bin Rizwan**

**37968**

**Dedication**

Our project is dedicated to our parents, seniors, friends, and our supervisor "Prof Tajamul Shahzad" who has been our continual source of inspiration and whose support has helped this project succeed. This project would not have been possible without their trust and support.

**Acknowledgement**

First of all we are obliged to Allah Almighty the Merciful, the Beneficent and the source of all Knowledge, for granting us the courage and knowledge to complete this Project.

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We also extend our deepest gratitude to our parents and family. Their unwavering belief in us and the values of hard work and integrity they have nurtured within us have been our guiding stars. It is with their blessings and constant encouragement that we have been able to achieve this milestone.

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**Mudabbir Ahmed**

**35830**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Saad Munaf**

**38748**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Saad bin Rizwan**

**37968**

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# Abstract

Diabetic Retinopathy is a serious complication of diabetes that affects the eyes, potentially leading to vision loss if left untreated. Early detection and accurate grading are crucial for timely treatment and better outcomes.

**Diabeto Vision** is a web application developed to offer assistance in scanning and determining the degree of severity of diabetic retinopathy using the latest machine learning algorithms. The system retrieves the fundus images of the eye and analyses them to see if the patient suffers from the problem and if yes, the level of severity is established. This easy to use platform seeks to give both patients and health care providers a fast and accurate method of detecting and coordinating the treatment of Diabetic retinopathy

**Chapter 1:**

**INTRODUCTION**

According to the WHO, the number of visually impaired people worldwide is estimated to be 2.2 billion, of whom at least 1 billion have vision impairment could have been prevented or are yet to be addressed. The world faces considerable challenges in terms of eye care, including inequalities in the coverage and quality of prevention, treatment, and forestall of rehabilitation services. Early detection and diagnosis of ocular pathologies would enable forestall visual impairment. The traditional diagnosis systems are slow, time-consuming, expensive and require a certain level of expertise to use, whereas the proposed system will provide an easy-to-use, reliable, fast, and cheap alternative for the users. It will be a web-based project which will integrate image-processing techniques. Medical professionals can also benefit from the system, as it will enable them to verify the results from conventional systems. The users are required to input fundus and retinal photographs of their eyes, and the system will preprocess them, extract features, and make a diagnosis based on the available datasets.

* 1. Goals and Objectives:

The primary goal of **Diabeto-Vision** is to screening and also grading the diabetes. Some goals and objectives are given below.

* + 1. **Goals:**
* Design a user-friendly React.js-based frontend.
* Implement secure login and registration systems.
* Allow users to upload fundus images for analysis.
* Integrate trained ML models for detection and severity grading.
  + 1. **Objectives:**
* Develop a web-based platform, Diabeto Vision, for detecting and grading diabetic retinopathy.
* Utilize machine learning models to analyze fundus images for accurate diagnosis.
  1. **Scope of the Object:**

**Healthcare Support:**

* Helps doctors and patients detect diabetic retinopathy early and understand its severity.

**Web-Based Access:**

* Users can access the platform from anywhere to upload fundus images and get results.

**Machine Learning Powered:**

* Uses trained ML models to provide accurate and reliable diagnoses.

**User-Friendly Design:**

* Simple and intuitive interface, making it easy for anyone to use.

**Data Security:**

* Ensures that all user data and images are kept private and secure.

**Scalable and Future-Ready:**

* Designed to handle more users and datasets as it grows.

**Educational Purpose:**

* Useful for medical research, training, and learning about diabetic retinopathy.

**Chapter 2:**

# LITERATURE REVIEW