

**DETEKSI DINI RETINOPATI DIABETIK MENGGUNAKAN
SINGLE SHOT MULTIBOX DETECTOR MOBILENET PADA
CITRA FUNDUS**

TUGAS AKHIR

Disusun oleh:

Matthew Maringka Caroles

18013052



**PROGRAM STUDI TEKNIK INFORMATIKA
FAKULTAS TEKNIK
UNIVERSITAS KATOLIK DE LA SALLE
MANADO
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Ditulis untuk memenuhi sebagian persyaratan untuk mendapatkan gelar Sarjana
Teknik pada Program Studi Teknik Informatika

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18013052



**PROGRAM STUDI TEKNIK INFORMATIKA
FAKULTAS TEKNIK
UNIVERSITAS KATOLIK DE LA SALLE
MANADO
2025**

LEMBAR PERNYATAAN

yang bertanda tangan di bawah ini:

Nama : Matthew Maringka Caroles
NIM : 18013052
Tempat/Tanggal Lahir : Manado/17 Juli 2000
Fakultas/Program Studi : Teknik/Teknik Informatika

Menyatakan bahwa Karya Ilmiah/Tugas Akhir dan atau Aplikasi/Program berjudul “**Deteksi Dini Retinopati Diabetik Menggunakan *Single Shot Multibox Detector* Mobilenet Pada Citra Fundus**” yang penulis buat adalah benar hasil karya penulis dan bukan karya tulis orang lain, baik sebagian atau seluruhnya kecuali dalam bentuk kutipan yang telah disebutkan sumbernya.

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Manado, 28 Juli 2025
Yang Membuat Pernyataan,

Matthew Maringka Caroles

Menyetujui,

Dosen Pembimbing I

Dosen Pembimbing II

Lanny Sitanayah, S.T., M.Sc., Ph.D. Michael G. Sumampouw, S.T., M.T.

Mengetahui,

Ketua Program Studi

Dekan Fakultas Teknik

Vivie D. Kumenap, S.T., M.Cs.

Ronald A. Rachmadi, S.T., M.T.



**UNIVERSITAS KATOLIK DE LA SALLE
MANADO-INDONESIA**

Nama : Matthew Maringka Caroles
NIM : 18013052
Fakultas : Teknik
Program Studi : Teknik Informatika
Judul Tugas Akhir : Deteksi Dini Retinopati Diabetik Menggunakan *Single Shot Multibox Detector* Mobilenet Pada Citra Fundus
Pembimbing I : Lanny Sitanayah, S.T., M.Sc., Ph.D.
Pembimbing II : Michael G. Sumampouw, S.T., M.T.

Manado, 28 Juli 2025
Menyetujui,

Dosen Pembimbing I

Dosen Pembimbing II

Lanny Sitanayah, S.T., M.Sc., Ph.D. Michael G Sumampouw, S.T., M.T.

Mengetahui,

Ketua Program Studi

Dekan Fakultas Teknik

Vivie D. Kumenap, S.T., M.Cs.

Ronald A. Rachmadi, S.T., M.T.

ABSTRACT

Early detection of eye diseases is a crucial step in preventing serious complications that may lead to permanent vision impairment. One of the most dangerous eye conditions is diabetic retinopathy, a complication of diabetes mellitus that damages the retinal blood vessels. Manual diagnosis by specialists requires time, expertise, and equipment that may not be readily available in remote areas. Therefore, an automated and widely accessible computer vision-based system is needed.

This study aims to develop an automatic detection application for diabetic retinopathy in fundus images using the Single Shot Multibox Detector (SSD) MobileNet architecture. The system is designed to quickly and accurately detect retinal abnormalities, such as microaneurysms and hemorrhages, and to improve the efficiency of initial screening processes for medical personnel. The model was trained using 261 fundus images over 60 epochs, and its performance was evaluated based on precision, recall, and mean Average Precision (mAP) metrics.

The application allows users to upload fundus images, predicts the presence of retinopathy, displays the confidence score, and provides information about the detected abnormalities. Model evaluation after 200 training epochs showed a precision of 49%, recall of 57%, mAP50 of 53.7%, and mAP50–95 of 25.7%. These results indicate that the model has a fairly good ability in recognizing signs of diabetic retinopathy in fundus images, although the accuracy of bounding box localization at various IoU thresholds can still be improved.

Keywords: *Diabetic Retinopathy, Fundus Image, Deep Learning, SSD MobileNet, Object Detection, Medical Image Analysis, Computer Vision.*

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