AI-Powered Segmentation of Retinal Fundus Images: Optic Disc and Optic Cup Focus

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PREFACE

Dear Readers,

The rapid and impressive developments in artificial intelligence over the last two decades have made this technology an integral part of our lives. Artificial intelligence now offers powerful solutions in many areas, particularly healthcare, and is radically transforming human life. Successful results achieved in the healthcare sector, in particular, are fueling interest in this field.

This book aims to provide fundamental information, starting with the historical development of artificial intelligence, a sub-branch of machine learning, and extending to deep learning models. The outstanding success of deep learning, particularly in the segmentation of digital images, has exponentially increased the number of research in this field and made deep learning one of the most popular topics in recent years.

This work includes examples demonstrating how deep learning is applied to medical image segmentation; it also presents details and test results of a new, more lightweight model inspired by existing popular segmentation architectures.

We hope this study will be a useful and inspiring resource for anyone interested in artificial intelligence or conducting research in this field.

Sincerely,

Gürkan Doğan, PhD

July, 2025

Tunceli

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