



A Comprehensive Review of Advances in Tongue Image Classification Techniques for Diabetes Identification

Ghazwan H. Hussien¹, Zainab N. Nemer²

^{1,2} Department of Computer Science, Basra University, Basra, Iraq

Article Info

Article history:

Received January 31, 2025

Revised March 5, 2025

Accepted March 12, 2025

Keywords:

Diabetes

Deep learning

Neural network

Tongue images

ABSTRACT

By grouping diabetics using tongue scans, therefore enabling non-invasive, economically priced, and efficient approaches to disease detection. Mostly focused on patient healthcare using medical diagnostics and early detection, research has evolved. This study issue has become more important since it supports early diabetes detection, helps clinicians and patients, and targets proactive treatments meant to reduce the condition. It helps doctors decide which important diabetes treatments to use because this metabolic disorder can damage many organs if it is not treated properly. Deep learning algorithms have made it possible to diagnose many diseases early, including diabetes, by processing and analyzing images of the tongue to classify diabetic patients. This makes it possible to combine feature extraction and pattern recognition. There are more people with diabetes around the world, and the number of new cases is also going up. People want accurate and reliable diagnostic tools, so they've made algorithms that look at pictures of tongues and get basic information from them. Using tongue photos, this paper presents a comprehensive review of current advancements in the classification and diagnosis of diabetes by focusing on developments in deep network designs, feature extraction techniques, assessment methods, and deep learning methodology. The approach uses tongue images to routinely analyze frequently used datasets and indicators for diabetes classification. It also covers the challenges faced and perhaps the routes of research to provide innovative ideas in this field.