Why eye tracking?  
Current methods, however, are limited in that they only measure individual cognitive skills that natural reading depends upon, but say little about their interplay and function in actual reading. Invariably, these tests require the subject to produce some explicit response, typically under time pressure, such as marking the word boundaries in sequences of words without interword spaces, matching target words to corresponding pictures, or reading aloud pronounceable nonsense words of increasing difficulty. The outcome measure–the proportion of correct responses–gives an estimate of performance on a particular task related to reading, but does not reflect the actual process of reading as it naturally occurs. To overcome this limitation, we investigate the use of eye tracking during reading as a means for identifying children at risk of dyslexia and long-term reading difficulties. By tracking eye movements during reading, we are able to follow the reading process as it occurs in real-time and obtain objective measurements of this process as a whole.

The subjects were instructed to read the text silently and to answer three questions about its content afterwards. The questions mainly served to encourage the subjects to read for comprehension; the actual outcomes were not used in any step of our analysis.

<https://onmyowntechnology.com/projects/Scalable-Dyslexia-Detection.pdf>

A report released by the Indian government in 2015 estimated that at least 35 million Indian children are dyslexic with millions more suspected to be undiagnosed

Evaluation conventionally involves a three-stepped process of information-collection from parents and educationalists, screening and testing; and intervention plan leading to conclusion and recommendations. Imageio library, which provides a platform to read and write image data, was used to locate pupils of the eyes. OpenCV Library, which is utilized for image processing, was used to trace eye coordinates and perform the motion tracking. Moreover, Numpy (array and numerical matrices) library was used to convert the vision pupils to array coordinates that the programming language can understand. Matplotlib, which functions on an object-oriented API, was used for face plotting. SciPy optimizes curve fit machine learning thathelps to track the eye while reading. Video Stream (imutils.video.VideoStream()) was used to give a live stream of the video without any break of the loop. Dlib is a toolkit containing machine learning algorithms and tools for creating complex software such as for this algorithm.

Current diagnostic tools: DALI: In India, the standardized procedure involves DALI, tools for school teachers and psychologists in Indian Languages to identify dyslexia. It works by asking a series of questions related to reading and word decoding abilities.

Kronoberg Projekt study unique is: 1) children were monitored over a long period of time and 2) the integrity of the recorded eye movement data.

Literature Review:

1. DETAILED REVIEW OF VARIOUS METHODS FOR DYSLEXIA DETECTION ANALYSIS:

Dyslexics can largely learn how to examine, write and have a look at successfully after they use methods designed to their unique studying fashion. Based totally on current development in principle and dyslexia dimension techniques, the evaluation of eye movements has emerged as one of the primary methodological equipment in experimental reading research. For that reason, the research on dyslexia detection is getting famous, which is based totally on the picture processing concepts. In this evaluation work we try to discuss photo processing techniques, characteristic extraction and function choice, numerous category strategies utilized in photo processing. The bankruptcy also deals with mastering disability and its types, measures of eye movements and how they're related to dyslexia. The important issues and blessings of each approach are discussed honestly in these assessment paintings. Eventually overview work mentioned approximately the scope of the future and research gap.

1. A Machine Learning Approach for Scalable Early-Age Dyslexia Detection:

This research tries to display dyslexia troubles for children at each age. This mechanism correlates an eyeball tracking and speech-popularity era, written in python with Matplotlib as the primary plotting library. The answer utilized is a scalable degree of dyslexia at every age. While the consumer is requested to examine a passage on the screen, the digicam traces the pupil’s positions with appreciation to eye momentum and route, recording the independent variables- fixations and saccades. by means of analyzing the distribution pattern of current datasets, the version makes a prediction. The consumer is then asked to examine aloud a sequence of 25 phrases, while the set of rules strategies the speech and identifies any discernible variations in speech-capabilities (related to dyslexia). The independent variables (enter parameters) are reaction time, backtracking, sudden pronunciation and studying time. The very last algorithm prediction affords consequences at the predicted stage of dyslexia. This novel answer aims to provide estimative predictions via combining eyeball tracking (reading) and speech recognition (phonology) so that the early detection of dyslexia leads to early intervention.

# Detecting dyslexia in children using a computer-aided diagnosis system:

Early detection is critical for dyslexics to obtain early and right remedy. This paper offers a look at the usage of a laptop-aided machine, MyAddyXia, to diagnose dyslexia amongst youngsters. It makes use of five simple exams - Alphabet, pattern, arithmetic, route and phrase tests. facts have been accumulated from 39 dyslexic children of the Dyslexia association of Malaysia (DAM). Those assessments diagnose the presence of reading and writing disabilities. The consequences of the examination confirmed that the Alphabet, arithmetic, and phrase tests had been best. The laptop literacy of the dyslexic youngsters and the remarks from the lecturers of DAM have been additionally highlighted.