

**Applicability of adaptive machine learning algorithm for improving reading and comprehension capabilities of dyslexic patients**

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*Dyslexia* is a well-known reading disorder that involves difficulty in fluent reading, decoding, and processing of words despite adequate intelligence. This causes the reading speed of such patients to be lower than the healthy counterparts, because of slow processing of letters and words. Despite this disorder, a dyslexic person can be trained to read at normal speed. The literature has mainly described manual methods and some technical improvements can be reported such as the *Live scribe smart pen*, *Dragon Naturally Speaking*, *Word processors*, and *Video Games*. From literature, it is evident that minimal efforts have been mobilized into the aforementioned focus and there is no way other than the manual method to identify the actual reading speeds, and to improve the speed according to the ability of a particular person. Thus, this study produces a novel Machine Learning-based (ML) algorithmic application, which allows customization on the reading speed based on the capabilities of patients, using experiment-based approach with real patients. The study is conducted via three phases. In the first phase of the study, reading rate improvement and detection methodologies are reviewed systematically in order to identify important characteristics of dyslexic improvements. Second phase is focused on developing an ML-based algorithm to identify the improvement rate of the dyslexic patients and training them using *Tensorflow* and *Python*. In the third phase, the outcome of the ML based algorithm is tested with samples from different clusters (using iterative experiments with real dyslexic patients). This approach improves the reading speed per minute of the dyslexic patients and lays the foundation for future research in the areas of ML, healthcare applications and ML-based training tools.

**Keywords:** Dyslexia, Machine learning techniques, Reading and comprehension capabilities