Transliteration of Sanskrit Scripts using Natural Language Processing and Meta-Heuristic Algorithms

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ABSTRACT

The systematic analysis of data to find unnoticed patterns, trends, and correlations is known as data analytics. Data analysts can convert unusable data into valuable information by using a variety of approaches, including statistical analysis, machine learning algorithms, and data visualization. Data analytics employs a variety of nature-inspired algorithms for process optimization, and this article will primarily focus on one of these topics. A difficult combinatorial optimization problem can be approximately solved using these meta heuristic algorithms, which are a higher-level optimization technique. Numerous optimization issues can be solved with these meta heuristic techniques. In the fields of artificial intelligence and linguistics, natural language processing (NLP) is used to facilitate communication between computers and human (natural) languages. NLP is applicable to speech-to-text, picture processing, and language transliterations. In this study, an effort was made to integrate NLP and meta-heuristic algorithms to translate Sanskrit scripts into Roman characters. A challenging linguistic endeavor that unites two different writing systems is transliterating Sanskrit scripts into roman characters.

Keywords: Meta-Heuristics Algorithms, Natural Language Processing (NLP), Sanskrit Scripts, Ant lion, DragonFly, Greywolf, Whale, Salp Swarm Optimizer, Optical Character Recognition (OCR).

1. INTRODUCTION

Numerous additional challenging optimization issues have emerged in the fields of computer science and data analytics with the advancement of artificial intelligence. Finding hidden patterns and the optimal answer to an optimization problem in a fair amount of time is the primary objective of data analytics. Because traditional optimization algorithms are inherently highly sluggish and inadequate for finding an optimum solution, non- traditional algorithms that are motivated by natural events and processes have been developed to address challenging optimization issues. Even though Traditional Algorithms can still be used, Non-Traditional Algorithms play a vital role in optimization problems. Those non-traditional optimization techniques are: Genetic Algorithm (GA), Particle Swarm optimization (PSO), Ant Colony optimization (ACO), Artificial Bee Colony (ABC), Cuckoo Search Optimization (CSO), Grey Wolf Optimizer (GWO), Arithmetic Optimization algorithm (AOA), Salp Swarm Algorithm (SSA), Ant Lion Optimizer (ALO), Whale Optimization algorithm (WOA), Dragonfly Algorithm (DA). These methods—also known as nature-inspired meta heuristic algorithms—are employed

6. CONCLUSION

We can mechanically translate Sanskrit scripts into Romanized scripts by integrating NLP and meta-heuristic techniques. These non- traditional meta heuristic algorithms get their inspiration from nature and apply it to determine the best optimized solution for the transliteration of scripts using NLP. Enhanced efficiency, global optimization, resilience, and other benefits are a few of the benefits of combining NLP and meta- heuristic algorithms. Furthermore, Sanskrit benefits from linguistic preservation, accessibility, universal applicability, and simplicity of scripts.

By including voice recognition elements into the program, these algorithms and NLP can be used for speech-to-text recognition in the future, where the input is speech and the output is in the Romanized format of the Sanskrit speech.

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