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Recognition of Punjabi Fonts and Characters

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Abstract

In the context of the relevance of regional languages in modern era, many modern tools have come into circulation. ICT has so far not been introduced in the realm of regional languages properly. It is widely assumed that computer based programs, software and web links do not support students in their learning of Punjabi. However, this paper offers a contesting yet positive view. This study is designed to prove that laptop, mobile phones, internet- connectivity and projector based learning is very effective for students in learning of Punjabi. This research paper is based on findings of qualitative nature. For this research purpose case studies have been used. Questionnaires are used to collect data. Data are analysed by using descriptive numerical techniques made to express frequency, percentage and mean. On the basis of findings few suggestions are made.

Keywords: Punjabi Language, regional languages, regional languages properly, express frequency, percentage

Introduction

The First Prominent Poet of the Punjabi Language

The spiritual and poetic expressions found in the *Shri Adi Granth* not only enhance the beauty and popularity of the Punjabi language but also reflect its rich literary heritage. Despite this inspiring history and a significant number of speakers, UNESCO has reported concerns about Punjabi's future, suggesting it could face significant decline over the next 50 years. Some reasons for this prediction include the perception that Punjabi is a language associated with lower-status jobs and less educated individuals. Additionally, it is often believed that Punjabi is not as technology-friendly as English.

Similar challenges are evident in the field of education. It is widely assumed that computer-based programs, software, and web links do not effectively support students learning Punjabi. However, this paper refutes this myth, demonstrating that modern tools such as laptops, mobile phones, internet connectivity, and projectors are highly effective for teaching Punjabi.

Punjabi is an ancient Indo-Aryan language spoken primarily in the Indian and Pakistani regions of Punjab. It is the 11th most widely spoken language globally, with nearly 90 million speakers. There are many Punjabi-speaking communities abroad, including in Canada, America, and the United Kingdom. While it is widely spoken in Pakistani Punjab, it does not have the same official status as it does in Indian Punjab.

Historically, Punjabi has a rich tradition of literature, dating from 840 A.D. to 940 A.D., with significant figures such as Baba Farid contributing to its literary development. Today, advancements in technology, such as Punjabi fonts and software like Akhar Software, have supported the development of the language. Various Punjabi fonts are available, including Raavi, Nirmla, Koharwala, DR Chatrik, and Akash.

This paper addresses issues related to font recognition and character problems in Punjabi. The Punjabi script presents challenges for font detection due to its large number of characters and complex combinations. Optical Character Recognition (OCR) has become a significant application of technology in pattern recognition and artificial intelligence. OCR involves converting scanned or photographed images of text into machine-readable text files. Punjabi OCR is an emerging area of research, focusing on recognizing Punjabi fonts and characters from printed documents.

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Preprocessing Phase

The character image is first captured and transformed into a format that can be processed by a computer. This phase prepares the raw image for further processing. The raw image is converted from RGB to grayscale and then to a binary image to make it ready for feature extraction.

Feature Extraction

After preprocessing, this phase involves extracting characteristics or attributes from an image. The accuracy of the pattern recognition system largely depends on these extracted features. Feature extraction is crucial for developing an effective Punjabi Font Recognition system.

The experiments conducted on Punjabi font and character recognition show that the Punjabi script presents significant challenges due to its complexity. To test the performance of the proposed method, a database containing Punjabi characters in various fonts was developed. The method was evaluated with 35 characters of the Punjabi language in 10 different font styles. Twelve font types considered in this dataset include Amrit, AmrLipi, AnmolLipi, AnmolKalmi, Asses, Bulara, GurbaniAkhar, GurbaniLipi, Lmptara, and Web Akhar Thick.

Conclusion

To our knowledge, there has been no study specifically addressing the Punjabi Font Recognition (PFR) problem. Existing studies primarily focus on Latin, Arabic, and Chinese fonts, which differ significantly from Punjabi fonts. Punjabi script presents unique challenges due to its extensive character set and complex combinations. This paper presents a novel solution to the Punjabi Font Recognition problem. The detection of font style can enhance character recognition. The average character recognition rate achieved is 90%, with an average font recognition rate of 99%. The primary advantage of this method is its robustness to noise. While other techniques are being developed, this approach, with minor adaptations, can also be applied to other languages such as English and Hindi for character recognition.

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