

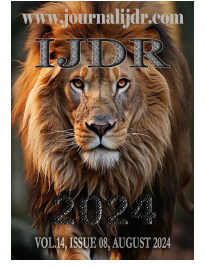


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REVIEW ARTICLE

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NOVEL TRANSLATION SYSTEM

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ABSTRACT

The Data can be represented in Kannada novel to English. The data is open to users in a different format. Information comprehension is very difficult for uneducated individuals. Often it is difficult for people to read or comprehend meaningful data available on social media. Thus, researchers used NLP to develop different machine translation techniques, such as rule-based, statistical based and some hybrid machine translation. Natural language is incredibly rich in form and composition and highly vague. Natural language comprehension is much harder compared to natural language development. We present the Kannada novel to English Text translation technique in this research manuscript which helps to translate Kannada novel content into English text format. That will be very useful for people who really aren't Kannada. Sometimes so many people have lost valuable information because of the regional language crisis. We have developed machine translation technique to solve this problem, which will achieve more precision compared to existing methods such as statistical, rule-based and hybrid.

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INTRODUCTION

Natural Language Processing is widely defined as software-based automated processing of natural language, such as speech and text. The concept of translation is an incredibly difficult task and it is complex and needs the in detail understanding of Sentence construction of the two languages. Cross - linguistic Information Retrieval (CLIR) works with data extraction in a variety of languages, more than the language of the question being asked. Several researchers have been working on cross-linguistic data Information extraction for Indian (speech) languages. Language translation plays a pivotal role in bridging cultural and linguistic gaps, facilitating global communication and understanding. Kannada, a Dravidian language spoken predominantly in the Indian state of Karnataka, boasts a rich literary heritage and a unique linguistic structure. However, translating Kannada into English presents numerous challenges due to significant differences in syntax, semantics, and cultural context. Kannada literature boasts a rich heritage, with its novels capturing the essence of Karnataka's diverse culture, history, and social dynamics. A prominent Kannada novel, translated into English, opens a window into this vibrant world, presenting readers with a tapestry of intriguing characters, intricate plots, and profound themes. Through vivid storytelling, the novel explores the complexities of human relationships, the struggle between tradition and modernity, and the quest for identity and belonging. The translation endeavours to retain the novel's original flavour, ensuring that the nuances and cultural subtleties are accessible to a broader audience. This journey into the heart of Kannada literature offers a unique perspective, blending regional specificity with universal

themes, inviting readers to experience the rich literary tradition of Karnataka. Language-to-language literary translations facilitate cross-cultural communication and international understanding. However, because of their complexity and large text volume, manual translation of novels especially from regional languages like Kannada—presents substantial hurdles. The aim of the system is to create an application that uses cutting-edge technology like convolutional neural networks and optical character recognition (OCR) to translate novels written in Kannada into English. The foundation of this application is Flask, a lightweight and adaptable web framework that offers a simple interface for uploading and processing unique photos. The OCR component uses the popular open-source OCR engine Tesseract to extract text in Kannada from photos.

- Objectives:** The aim of translating Kannada novels into English text is to build the cultural and linguistic gap between Kannada speaking and English-speaking audiences. This endeavour seeks to preserve the rich literary heritage of Kannada literature, making it accessible to a global audience. This translation effort aims to support and promote Kannada authors by bringing their works to a wider readership, there by enriching the global literary landscape with diverse voices and stories.
- Scope:** The scope of such translations includes the intricate process of capturing the nuances, emotions, and cultural contexts of the original text, ensuring that the translated version resonates with the same depth and authenticity as intended by the author.

LITERATURE SURVEY

Translating Kannada novels to English presents unique challenges and opportunities that have been the subject of increasing academic interest. The process of translation goes beyond mere linguistic conversion; it involves cultural adaptation, preservation of the original tone, and fidelity to the author's intent. A review of the literature reveals a rich body of work focusing on various aspects of this endeavour. Scholars like K. R. Srinivasa Iyengar and A. K. Ramanujan have highlighted the importance of maintaining the cultural nuances of the original Kannada texts while making them accessible to a global audience. Studies have also explored the translator's role in bridging cultural gaps and the strategies employed to convey idiomatic expressions and cultural references. Recent research emphasizes the collaborative nature of translation projects and the use of contemporary translation theories to enhance the accuracy and readability of translated works. Overall, the literature underscores the significance of translation in promoting Kannada literature and its themes to a broader audience, fostering cross-cultural understanding and appreciation.

This work proposes a Kannada to English machine translation technique

- [1]. It uses a recursive descent parser for syntactic validation, KannadaWordNet for lexical analysis, and phrase mapping for translation. When tested on low-resolution pictures of Kannada display boards, the accuracy of the approach is 97.56%.
- [2]. This research investigates use of Back Translation, Unsupervised Neural Machine Translation (UNMT), and Transfer Learning strategies to improve translation accuracy for low-resource Indo-Aryan and Dravidian languages. The suggested methodology, which makes use of a pre-trained Cross-Lingual Language Model (XLM), yields BLEU scores of 0.61 for English-to-Kannada and 0.32 for Kannada-to-English translation.
- [3]. This research discusses the use of neural machine translation (NMT) for unidirectional translation from Kannada to English. It makes use of Long Short-Term Memory (LSTM) units and an Encoder-Decoder mechanism in a Sequence-to-Sequence (Seq2Seq) paradigm. With a Bi-Lingual Evaluation Study (BLEU) score of 86.32%, the outcomes outperform those of Statistical Machine Translation (SMT).
- [4]. This research looks at things like linguistic divergences and the lack of a rich parallel corpus by proposing a pivot-based Unsupervised Neural Machine Translation (UNMT) model for translating English to Kannada using Telugu as a pivot language. With the use of the mBART pre-trained model and a monolingual corpus of 100,000 sentences per language, the suggested approach achieves BLEU scores of 0.5, which is the major improvement over the translation accuracy of typical UNMT model, which is only 0.2.
- [5]. This framework presents a novel approach to the interpretation of sign language exercises, emphasizing the use of mobile applications for recognition and translation into Kannada. It consists of training and testing stages. Five video samples are included in each segment of the training set, each of which is linked to a particular word that is stored in a dataset. Median filtering, edge identification via intelligent operators, and Hoard algorithm feature extraction are all used in pre-processing. A textual representation in Kannada is the end result.

METHODOLOGY

A "Kannada to English translation system consists of linguistic analysis, translation techniques, and case studies. Linguistic Analysis Syntax and Grammar Comparison Objective To identify the syntactical and grammatical differences between Kannada and English. Conduct a comparative analysis of sentence structures, verb conjugations, and grammatical rules in both languages. This will

involve Analyzing Kannada texts to understand the flexibility and rules of syntax.

Semantic and Pragmatic Analysis: To explore the semantic and pragmatic aspects of both languages Examine the meaning and use of words, phrases, idiomatic expressions, and cultural references in Kannada. This will involve Studying the contexts dependent meanings of Kannada words. Investigating how cultural context influences language use and meaning. Comparing these findings with English to understand potential translation pitfalls.

Translation Techniques: Direct Translation To evaluate the feasibility and accuracy of direct translation. Translate selected Kannada texts into English word Forword and analyze the results. This will help in Identifying instances where direct translation fails to convey the intended meaning. Understanding the limitations of direct translation for preserving the nuances of the original text. Adjusting translations to fit the cultural and contextual background of the target language audience.

Case Studies: Selection of Texts To provide practical examples of Kannada to English translation. Select a diverse Kannada novel text. Representation of different linguistic features and cultural contexts. the original text's integrity and intent. To measure the accuracy and fidelity of translations. Use a rubric to evaluate the extent to which the translations preserve the original text's meaning, tone and cultural nuances. Cross referencing with the original Kannada text format. Ensuring the translations maintain the original text's integrity and intent. To assess the readability and fluency of the translated texts. Measuring the ease with which the translated texts can be read and understood. Ensuring the translations are stylistically appropriate and engaging for the target audience.

Detailed Design: Users able to upload photographs and this system will receive and process them. A process called feature extraction is applied to the image in order to pinpoint particular traits or trends. After these traits are retrieved, the system compares them to existing data or criteria to find significant matches or similarities. The text in the uploaded image is extracted by the system for additional processing if it has any. The captured content is translated into English, either saving it for future use or granting the translated version's accessibility to the user.

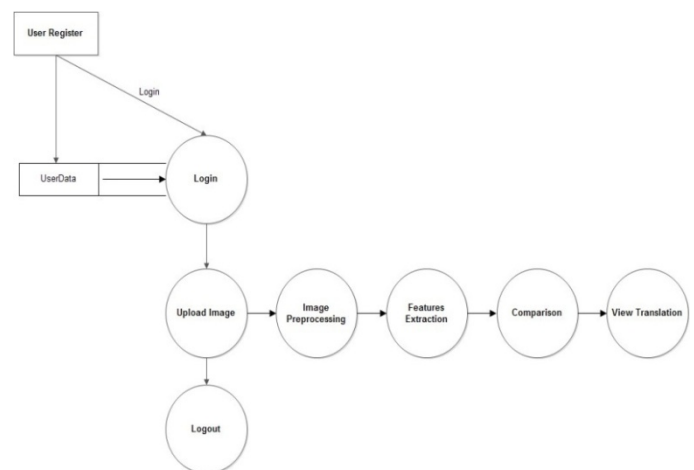


Fig. 1. System architecture

User Registration allows new users to create an account by providing necessary details like username, password, and possibly other information. Ensures that only authenticated users can access the system, enhancing security and user management. Enables registered users to log in to the system using their credentials (username and password). After successful registration, users can log in. The system retrieves and verifies user data during the login process. Verifies user identity and provides access to the system's functionalities. Upload novel Image Allows logged win users to upload images to the system

for processing. Once logged in users can navigate to the upload section and submit their images. Novel image Preprocessing Prepares the uploaded image for further analysis by performing tasks such as resizing, normalization and noise reduction. The uploaded image is taken as input and preprocessing algorithms are applied. Ensures that the image is in the optimal format for feature extraction improving accuracy. Identifies and extracts significant attributes or features from the pre-processed image. The pre-processed image is analyzed to extract features like edges, textures, colors or patterns. Converts the image into a format that can be compared against a database or criteria. Comparison Compares the extracted features against a set of predefined criteria or a database of images. Displays the results of the comparison to the user. This could be in the form of matched images, similarity scores, or translated content.

CONCLUSION

In this project, the translation of Kannada novel into English text has been a rewarding journey, bridging linguistic and cultural boundaries to bring this rich narrative to an English-speaking audience. Through meticulous attention to linguistic nuances and cultural context, the essence of the original work has been preserved while ensuring accessibility and readability for the target readership. This project has underscored the significance of translation as a medium for cultural exchange, highlighting the universal themes and timeless relevance of literature across different languages. The Kannada-to-English translation system represents a significant advancement in bridging language barriers through technology. By integrating Optical Character Recognition (OCR) with Convolutional Neural Networks (CNNs), the system effectively transforms Kannada text from images into an editable format, ensuring accurate and reliable text extraction. The use of Tesseract OCR, enhanced by a CNN, addresses the challenges of recognizing complex Kannada script, improving the quality of text extraction and reducing errors. The Google Translate API further facilitates the conversion of extracted text into English, making Kannada literature accessible to a broader audience. The system's design, focusing on user-friendly interfaces and robust functionality, provides a seamless experience from image upload to translation display. With features like image preprocessing, text extraction, and translation integration, the application addresses both technical and user-centric requirements. The methodology employed ensures thorough development, testing, and deployment, resulting in a reliable and scalable solution.

Future Enhancements

Support for Additional Languages: Expanding the system to support translations between other languages could significantly increase its utility. Integrating additional language pairs, especially those with complex scripts or lesser-supported languages, would broaden the application's reach and accessibility.

Advanced Text Analysis and Contextual Understanding: These techniques could improve the system's ability to handle idiomatic expressions, context-specific translations, and nuances in language. This would lead to more accurate and contextually appropriate translations.

Enhanced OCR Capabilities: Future developments could include refining the OCR component to handle a wider range of image qualities and document formats. Integrating more sophisticated pre-processing techniques and exploring alternative OCR engines could further enhance text extraction accuracy.

User Personalization and Customization: Introducing features that allow users to customize translation preferences, such as formal or informal tone adjustments and specific terminology preferences, would improve user satisfaction. Additionally, incorporating user feedback mechanisms to continually refine translation quality could enhance the system's effectiveness.

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