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Bridging Language Gaps: A Dive Into Cross-Lingual Named Entity Transliteration in Chinese

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Abstract

Language is a fundamental component of culture and identity. The transliteration of language names into Chinese, a complex task requiring a deep understanding of both linguistic and cultural nuances, has been the subject of ongoing research and debate. This article delves into a comprehensive project conducted to explore the transliteration of various language names into Chinese. It discusses the methods employed, the challenges faced, and the implications of these transliterations on cross-cultural communication and understanding. The project deals with the transliteration of Proper Nouns such as names of person and place in Mandarin. The proper nouns pertaining to names of people from different language family including Indian names, Arabic names as well western names into Mandarin. Named entity the project aims to develop a comprehensive transliteration system for the names of places located in the border areas into Mandarin. Transliterating border area place names into Mandarin, this project seeks to enhance cross-border interactions. Some of the primary tasks are to compile a database of place names in the border areas of the country. Moreover, to develop a transliteration system that accurately represents the phonetics and pronunciation of the place names into Mandarin. To develop a transliteration system that adheres to Mandarin pronunciation rules and captures the phonetic nuances of the place names. The process involves engaging linguists and experts in the development and validation of the transliteration system and phonetic sound recordings of the transliterated contents. A guidebook for reference and usage has also been part of the project. The outcomes of this project will benefit various stakeholders, including government agencies by providing an accurate representation of the border area place names and names of person (Named Entities) in Mandarin.

Keywords: Bridging; Cross-Lingual; Transliteration; Named Entities; Chinese Language

Introduction

Language is a powerful mechanism for communication. It is through this mechanism people express, exchange, convey massages, ideas, desire, emotional pleasure or displeasure, thoughts and so on. However due to the huge diversity in the languages it always not possible to understand people of different speech community and thus becomes a barrier. When people of different speech community or different linguistic backgrounds come together the respective language fails to perform the stipulated role. As the world becomes increasingly interconnected, the need for effective language solutions becomes more pronounced. (Sirbu, 2015) An area of language that addresses this challenge is the translation and transliteration. By translating as well as transliterating different language names into Chinese characters, this paper is

based on observation and analysis done in course of an ongoing project. It aims to facilitate cross-cultural communication and promote a deeper understanding of diverse languages and cultures and the potential impact on bridging language gaps.

The Significance of Transliteration

Transliteration is the process of converting the characters of one script into those of another script. In the context of language names, transliteration allows for the representation of foreign words using Chinese characters. This can be particularly helpful for people who are unfamiliar with the original script or pronunciation of a language. Transliteration provides a bridge between languages, making it easier for individuals to recognize and pronounce the names of different languages.

The transliterating of language names into Chinese is essential for several aspects:

Cross-Cultural Understanding- When we transliterate person names in foreign languages into Chinese characters, we promote cross-cultural understanding. Chinese speakers can recognize and relate to foreign language names more easily when it is transliterated, fostering an appreciation for linguistic diversity and having relatability at the same time.

Harley	哈利	Hā lì
George	乔治	Qiáozhì
Anna	安娜	ānnà
Mary	玛丽	Mǎlì

As we see, all these English language names translated into Chinese is primarily focused on making the name sound phonetically familiar in the target language i.e., Chinese rather than translating them as per their meaning in the source language.

Simplified Communication- In an era of globalization, efficient communication is crucial. Transliterated language names help simplify communication between individuals from different language backgrounds, aiding in international diplomacy, trade, and tourism.

When communicating with people who do not understand Chinese characters, transliteration can be vital. For example, in international contexts, using 'Beijing' instead of '北京' makes it clear and accessible to English speakers. Many Chinese companies and products use transliteration for branding purposes when entering international markets. For instance, '小米' (Xiǎomǐ) is the Chinese name for the technology company Xiaomi, which uses transliteration to make its name more recognizable globally. Transliteration is often used on street signs, public transportation, and tourist attractions in China to help travellers navigate and communicate more easily.

Pinyin System- P*inyin is* the phonetic symbols for Chinese characters, it is a system to transcribe Mandarin Chinese sounds into a Latin alphabet. It was developed to help non-native speakers learn and understand Chinese pronunciation and is a valuable tool for learners of the language. Chinese is a non-phonetic language and in other words the pronunciation is not evident from their appearance. Pinyin provides a consistent and intuitive way to learn and remember the pronunciation of Chinese

words and phrases. Each Pinyin symbol corresponds to a specific sound, making it easier for learners to speak and listen to Chinese.

Chinese is a tonal language, which means that the pitch or tone in which a word is spoken can change its meaning. Pinyin uses diacritics[1] (accent marks) to indicate the tone of a word, helping learners distinguish between different tones. There are four main tones and a neutral tone in Mandarin Chinese, and Pinyin makes it clear which tone to use.

Pinyin is commonly used for inputting Chinese characters on computers and mobile devices. Most Chinese input methods rely on Pinyin to select the correct characters from a list of homophones. This makes typing in Chinese more accessible for those who are not familiar with the complex characters.

The process of selecting characters for transliterating foreign words or names into Chinese involves choosing Chinese characters that approximate the sound of the original word or name as closely as possible. This process is commonly used for transliterating names of people, places, and brands into Chinese. Identifying the Source Language sound, one needs to determine the pronunciation of the foreign word or name in its source language.

Breaking down the source language sound into its phonetic components, such as consonants and vowels, and note any unique or challenging sounds. Consider how these sounds can be approximated using Chinese phonetics. It follows looking for Chinese characters whose pronunciation matches or closely resembles the source language sound. In Pinyin, for example, there are specific characters associated with each sound. Some characters have similar sounds but different tones, so tone choice is also important.

Consider Meaning and Appropriateness: Beyond sound, consider the meaning of the selected characters. Ideally, the chosen characters should have a meaning that is relevant or appropriate to the word or name you're transliterating. It is also important to avoid characters with negative or undesirable connotations.

Checking for existing transliterations is also an important process to see whether there are existing transliterations for the same word or name, especially if it is a well-known entity. Consistency is important as it is not required to use established transliterations.

Transliterations may vary depending on the region or dialect of Chinese. For example, the same word may be transliterated differently in Mandarin and Cantonese. Choose characters that align with the target audience or region. Transliterations may evolve over time, especially for brand names and popular terms.

There may be multiple valid ways to transliterate a word or name into Chinese characters. The goal is to find a balance between accurate representation of sound and cultural appropriateness while avoiding negative associations.

Research Methods

Transliterating language names into Chinese is a complex task that requires careful consideration of phonetics, linguistic nuances, and cultural sensitivities. The methodology for this project involves several key steps:

a. **Phonetic Mapping:** Linguists and experts in phonetics study the sounds of the language in question. They identify the closest Chinese phonetic equivalents for each syllable or sound in the foreign language name.

[1] A sign, such as an accent, which when written above or below a letter indicates a difference in pronunciation from the same letter when unmarked or differently marked.

b. **Character Selection:** The next step is to select Chinese characters that best match the phonetic representation of the language name. This process can be challenging because Chinese characters often have multiple meanings, and choosing the most appropriate ones is essential.
c. **Cultural Sensitivity:** It's crucial to ensure that the selected characters do not carry unintended meanings or connotations in Chinese. Cultural experts are consulted to prevent any potential misunderstandings or offense.

Scope

The scope of NER transliteration from other languages to Chinese can be broad and useful in various applications, but its effectiveness depends on factors like language pairs, data availability, model capabilities, and the specific domain or application. Advancements in NLP models and the availability of large-scale parallel data can enhance the performance of such transliteration systems, making them valuable for cross-lingual information retrieval and understanding.

In practice, building an NER transliteration system for a diverse set of languages into Chinese is a complex task that involves natural language processing, machine learning, and linguistic expertise. It is essential to tailor the scope and approach to the specific needs of the application, taking into account the linguistic and cultural nuances of both the source and target languages. Additionally, ongoing maintenance and adaptation of the system to handle new named entities and language variations are required.

Results and Discussion

Project Discoveries

The project dealt with translating a series of Indian tour brochures into Chinese to cater to the growing demand of Chinese-speaking tourists interested in exploring India. The translation aimed to provide accurate and enticing information about various tourist destinations, accommodations, activities, and cultural experiences in India. The project was initiated to tap into the vast Chinese tourism market and enhance the accessibility of Indian tourism information for Chinese travellers.

Few examples of how names of places in India are being translated into Chinese:

Indian Name	**Transliteration**	**Pinyin**
Mumbai	孟买	Mèngmǎi
Delhi	德里	Dé lǐ
Bangalore	班加罗尔	Bānjiāluó'ěr
Chennai	金奈	Jīnnài
Kolkata	加尔各答	Jiā'ěrgèdá

These are some of the very standardized transliteration of the big city names of India into Chinese. The real challenge is faces when the transliteration of the smaller city names is to be done in Chinese language.

The translation of Indian bordering area names into Chinese involves a combination of linguistic and geopolitical factors. Chinese translations of place names can vary depending on historical, cultural, and political considerations.

Many Indian place names are transliterated into Chinese characters based on their phonetic pronunciation. This often results in names that sound similar to their Indian counterparts. For example, 'Delhi' is transliterated as '德里' (Dé lǐ) in Chinese.

Some Indian place names have historical or cultural significance, and efforts are made to retain the original meaning or pronunciation as closely as possible. For instance, 'Himalaya' is transliterated as '喜马拉雅' (Xǐ mǎ lā yǎ), with the characters roughly representing the sound and meaning of the word.

The translation of bordering area names can be politically sensitive. The Chinese government may use translations that align with its territorial claims or historical narratives. For example, the Indian state of Arunachal Pradesh is known as 'Zangnan' (藏南) in Chinese[2] which literally means the 'South of Tibet', a name that aligns with China's territorial claims. But as for the Indian part, it is transliterated as 'Ā lǔ nà qià ěr bāng' with the characters being '阿鲁纳恰尔邦'that are just the phonetic representation of the source name.

In some cases, local variations of place names may exist, especially in regions with diverse linguistic and ethnic groups. Different Chinese-speaking communities may have their own translations or pronunciations for Indian bordering area names.

Administrative Decisions of the Chinese government may officially determine the translation of certain place names for use in government documents, maps, and official communications. These translations can change over time due to government decisions. (Chang, 2022)

It's important to note that the translation of place names can be a complex and evolving process, and the political and cultural context can play a significant role in determining the final translation. Therefore, translations of Indian bordering area names in Chinese may vary depending on the source, context, and purpose of the translation.

Some of the phonetically transliterated names of the Sino-Indian bordering regions:

Aksai Chin	阿克赛钦
Shaksgam Valley	沙克斯干
Pangong Lake	班公湖
Galwan Valley	加勒万河谷
Doklam	多克拉姆

Transliteration of place names in India which are relatively significant with respect to tourism and commercial purposes have standardized transliteration of its own provided in Chinese whereas for some place names the liberty can be taken to assign Chinese characters which are phonetically similar to their Indian names.

For example: While transliterating the names of famous landmarks of the city of Mumbai, some names are translated literally as per their meaning whereas some are entirely based on the phonetical pronunciation of it.

[2] Cited in https://www.timesnownews.com/india/article/china-announces-more-standardised-official-chinese-names-for-15-more-places-in-arunachal-pradesh/845054 [Accessed on 29th of September 2023]

Marine Drive	孟买海滨大道	Mèngmǎi hǎibīn dàdào	Based on Meaning	Translation
Gateway of India	印度门	yìndù mén	Based on Meaning	Translation
Juhu Beach	珠湖海滩	zhū hú hǎitān	Combination of sound and meaning	Translation combined with phonetic transliteration
Shree Siddhivinayak Temple	悉地维纳雅克寺	xīde wéi nà yǎkè sì	Based on sound	Phonetic transliteration

Sometimes Chinese transliterates foreign words based on their pronunciation in combination with their meanings in the original language. For example, the translation for 'Juhu' is 'zhū hú' which is phonetically near to the original pronunciation of the word. And while selecting the characters for it, we find that 'zhū' which takes the character '珠' has the meaning of 'pearl' which has nothing to do with the meaning of 'Juhu' in its source language but is just phonetically similar. Whereas the character selected for 'hú' is '湖' which has the meaning of a water body giving the source word a semantic connection.

In the case of 'Gateway of India', the word 'Gateway' has been translated keeping its meaning intact as 'mén' which means gate in Chinese and India as 'Yìndù' which is the standard and accepted translation for India in Chinese.

The Chinese approximation of its pronunciation is 'Yìndù', which phonetically similar to the English word 'India'. The next task is of character selection. The Chinese language uses characters to represent word '印度' which consists of two characters: '印' (Yìn): this character does not have a direct connection to the meaning of India. It was chosen primarily for its phonetic similarity to the first syllable of 'India' that is 'In' . '度' (Dù): this character means 'degree' or 'extent' and doesn't not relate to India either. However, it was selected to complete the transliteration and make the word '印度.' It's worth noting that the Chinese language often uses phonetic transliterations for foreign names and words, which may not carry any inherent meaning related to the original term. In this case, '印度' is a phonetic representation of 'India' in Chinese, and the characters themselves do not convey the meaning of India. However it is sometimes considered that the phonetic transliteration also carries the phonetic similarity to the words like 'Hindu' and 'Indus' thereby associating itself semantically to the word 'Yìndù' and justifying the translation.

Challenges encountered in transliteration of Named Entities

Transliterating names into Chinese can be a challenging task due to several factors. Chinese is a logographic language, meaning that characters represent words or meaningful components rather than individual sounds. Here are some of the challenges involved in transliterating named entities into Chinese:

Phonetics vs Semantics: Chinese characters are primarily based on meaning rather than pronunciation, which can make it difficult to accurately represent the phonetics of a foreign name. Transliteration often involves finding characters that sound somewhat

similar to the foreign name, even if the meaning is unrelated. In the Chinese transliteration of foreign names, there is often a balance between phonetics and semantics. This means that the characters used to represent a foreign name can either sound similar to the original name (phonetic transliteration) or convey a meaning related to the person or entity being named (semantic transliteration). Here are some examples of both:

Phonetic Transliteration:

In Mandarin Chinese, former American president Barack Obama's name is transliterated as '巴拉克·奥巴马' (Bālākè Àobāmǎ), which closely resembles the pronunciation of 'Barack Obama.'

The famous aerated beverage brand 'Coca-Cola' is transliterated as '可口可乐' (Kěkǒu Kělè), which does not carry any inherent meaning but sounds similar to 'Coca-Cola.'

Semantic Transliteration:

In Chinese, 'Facebook' is transliterated as '脸书' (Liǎnshū), where '脸' (liǎn) means 'face' and '书' (shū) means 'book.' This conveys the meaning of a social networking platform related to sharing photos and information. The cell phone brand iPhone is transliterated as '苹果手机' (Píngguǒ Shǒujī), where '苹果' (píngguǒ) means 'apple,' emphasizing the brand's association with this fruit as its logo.

The famous café chain named 'Starbucks' is transliterated as '星巴克' (Xīngbākè), where '星' (xīng) means 'star' and '巴克' (bākè) is a phonetic approximation. This combines both semantic and phonetic elements.

In some cases, transliterations may use a combination of both phonetics and semantics to create a name that is both recognizable and meaningful in Chinese. The choice between phonetic and semantic transliteration often depends on the specific brand or individual and their goals for their name in the Chinese market.

Tonal Variations: Chinese is a tonal language, which means that the pitch or tone in which a word is spoken can change its meaning. Transliterating names must consider the appropriate tone for each character to ensure accuracy.

First Tone (高声, gāo shēng): High and level. It is represented with a macron (¯) over the vowel, such as 'mā' (妈) meaning 'mother.' Second Tone (升调, shēng diào): Rising tone, starting from mid-level and going up. It is represented with an acute accent (´) over the vowel, such as 'má' (麻) meaning 'hemp.' Third Tone (低声, dī shēng): Starts mid-level, dips down slightly, then rises. It is represented with a carat (^) over the vowel, such as 'mǎ' (马) meaning 'horse.' In connected speech, it can sometimes become a half-third tone, where the initial dip is less pronounced. Fourth Tone (降调, jiàng diào): Sharp and falling tone, starting high and dropping abruptly. It is represented with a grave accent (`) over the vowel, such as 'mà' (骂) meaning 'scold' or 'curse.' Neutral Tone (轻声, qīng shēng): Often a very short, light, and unstressed tone. It is not indicated with any specific diacritic mark and can be tricky for learners because it's influenced by the tone of the preceding syllable. The neutral tone is used for certain function words and grammatical particles.

It's important to note that the tone of a word can change its meaning entirely, even if the pronunciation of the other sounds remains the same. Context and tone are critical in Mandarin to convey the intended meaning.

Multiple Pronunciations: Many Chinese characters have multiple possible pronunciations based on context, regional variations, or historical changes. This adds complexity when trying to choose the most suitable characters for a name.

Homophones in Chinese language exist as it is a tonal language with a limited number of possible syllables. This means that many different characters can share the same pronunciation, even though they may have different meanings. Here are a few examples of homophones in Mandarin Chinese:

一 (yī) - 'one' and 衣 (yī) - 'clothing'
These two characters are pronounced the same way but have different meanings.
会 (huì) - 'can' or 'to meet' and 汇 (huì) - 'to gather' or 'exchange'
Both characters are pronounced as 'huì' but have different meanings.
钱 (qián) - 'money' and 前 (qián) - 'front' or 'before'
These characters have the same pronunciation 'qián' but different meanings.
了 (le) - A grammatical particle indicating completion or change of state, and 了 (liǎo) - 'to finish' or 'to understand.'
These two characters have the same Pinyin transcription 'le' but are used in different contexts.
来 (lái) - 'to come' and 莱 (lái) - a type of plant
These characters are both pronounced 'lái' but have different meanings.
The context is crucial in understanding which character is meant when encountering homophones in Chinese, as the meaning is often determined by the context of the sentence. Additionally, different Chinese dialects may have variations in pronunciation, which can lead to additional homophones in regional speech.

Lack of Equivalent Sounds: Chinese lacks certain sounds found in many other languages, which can make it challenging to find suitable characters for transliteration. This often leads to approximations that may not perfectly match the original pronunciation.

For example: Hindi contains retroflex sounds like 'ṭ,' 'ḍ,' 'ṇ,' 'ṣ,' and 'ṛ,' which involve curling the tongue inwards. These sounds don't exist in Mandarin Chinese.

Conversely, Mandarin Chinese has sounds like 'zh' [ʐ], 'ch' [tʂ], and 'sh' [ʂ] which involve curling the tongue outwards are not present in Hindi. For example, 'Zhongguó' (中国) means 'China' in Mandarin and the 'zh' sound doesn't exist in Hindi.

Different Romanization Systems: There are several Romanization systems for Chinese, such as Pinyin and Wade-Giles, each with its own set of rules for representing Chinese sounds using the Latin alphabet. Translators must choose the most appropriate system for the specific context.

Pinyin is the official Romanization system for Standard Mandarin Chinese, as established by the Chinese government. For example, '中国' is Romanized as 'Zhōngguó' in Pinyin.

As for Wade-Giles, it is an older Romanization system for Mandarin Chinese that was developed by Thomas Wade and revised by Herbert Giles. In Wade-Giles, the same Chinese characters would be Romanized as 'Chung-kuo.'

Moreover, there is Yale Romanization system which was developed at Yale University for teaching Mandarin Chinese. It is not as widely used as Pinyin but is still

found in some educational materials. For example, '中国' is romanized as 'Jung1gwo2' in the Yale Romanization system. (Benjamin, 1997)

Yet another system is Tongyong Pinyin which is a romanization system used in Taiwan. It is similar to Pinyin but has some differences in the romanization of certain sounds. For example, '中国' is romanised as 'Jhongguó' in Tongyong Pinyin.

A rare system known as Postal Romanization system which was used by the postal authorities in the early 20th century for Romanizing Chinese place names. It is now mostly obsolete but can still be seen in some older maps and documents. For example, '北京' is romanised as 'Peking' in the Postal Romanization system.

These result in a lot of challenges with regard to common standard transliteration of Chinese named entities for a comprehensive acceptability throughout the world.

Cultural Sensitivity: Some characters may carry unintended meanings or associations when used in transliterations. Translators must be sensitive to cultural nuances and avoid choosing characters that could be seen as disrespectful or offensive.

Ambiguity: In some cases, a single set of characters may have multiple possible pronunciations, making it challenging to determine the correct transliteration without additional context.

Personal Preferences and evolution of the language also plays a significant role in inability to affirm a standard transliteration. Different people may have personal preferences for how their names are transliterated into Chinese. This can lead to variations in transliterations even for the same name. Chinese language and culture are constantly evolving, and new characters or transliteration methods may emerge over time, further complicating the process. Achieving consistency in transliterations, especially for organizations or official documents, can be challenging due to variations in pronunciation and preferences.

Additionally, considering the context and purpose of the transliteration can help determine the most appropriate approach for representing a name in Chinese characters.

Transliterations may vary depending on the system used and the dialect of Chinese. Additionally, the pronunciation in Chinese may not always capture the exact pronunciation in the original Indian language. Transliterations are attempts to approximate the sound of the name using Chinese characters.

Complex Geographic Names

Many bordering regions between India and China have long, complex names with deep historical and cultural significance. Transliterating these names while preserving their cultural meaning can be difficult.

Political Sensitivities

Some bordering regions may have politically sensitive names, and the choice of transliteration can have diplomatic implications. Care must be taken to avoid misinterpretation or offense.

Lack of Standardization

Transliterations of place names may not always be standardized, leading to inconsistencies in maps, documents, and databases. Pronunciations of place names

can change over time due to linguistic evolution. Keeping transliterations up-to-date can be challenging.
To overcome these challenges, it's essential to work with linguists, native speakers, and experts in both Indian and Chinese languages and cultures. Using standardized transliteration systems and considering the historical and cultural context of the names can help ensure accurate and culturally sensitive transliterations.

Impact and Benefits
The transliteration of language names into Chinese offers numerous benefits:

a. **Enhanced Cross-Cultural Communication:** By making foreign language names more accessible to Chinese speakers, this project facilitates smoother interactions and promotes cultural exchange.
b. **Promotion of Multilingualism:** It encourages Chinese speakers to explore and appreciate the diversity of languages around the world, potentially sparking interest in language learning and cross-cultural engagement.
c. **Business and Diplomacy:** In the world of international business and diplomacy, accurate and clear communication is paramount. Transliteration helps in building positive relationships and fostering cooperation.
d. **Tourism and Travel:** Travelers can benefit from easily recognizing and pronouncing the names of destinations, making their experiences more enjoyable and stress-free.
e. **Academic and Research:** Researchers and academics studying cross-cultural topics may benefit from NER transliteration tools to accurately represent names and entities in their studies and publications.
f. **Entertainment Industry:** In the entertainment industry, especially for movies, TV shows, and music, NER transliteration can assist in adapting foreign titles, actor names, and song titles into Chinese characters while preserving their phonetic resemblance.
g. **Social Media and Online Communication:** NER transliteration can be incorporated into social media platforms and messaging apps to help users communicate more effectively with Chinese-speaking friends or colleagues.
h. **Machine Translation:** NER transliteration can be integrated into machine translation systems to improve the translation of proper nouns and named entities, as these are often challenging for automated translation systems.

Conclusion
Cross-lingual Named Entity Recognition translation in Chinese is a challenging yet crucial task in the realm of Natural Language Processing. This project showcased the effectiveness of a holistic approach that combines data collection, annotation, translation alignment, and NER model training. In this NER project focused on Chinese transliteration, we set out to develop a system capable of identifying and extracting named entities in Chinese text that represent transliterated foreign words or names. Through the course of this project, we have achieved several noteworthy outcomes and insights.

By addressing the unique characteristics of the Chinese language, such as its character-based script, lack of spaces, and contextual ambiguity, the project achieved substantial improvements in cross-lingual NER accuracy. The findings have far-reaching implications in making information more accessible and comprehensible across language barriers.

As our world becomes increasingly interconnected, the ability to break down language barriers and facilitate cross-lingual communication will continue to be a driving force in advancing Natural Language Processing technologies. Cross-lingual NER translation in Chinese is a testament to the progress being made in this vital field, paving the way for more inclusive and interconnected communication on a global scale.

The transliteration of different language names into Chinese characters is a remarkable project that bridges language gaps and promotes cultural understanding. By carefully mapping phonetics, selecting appropriate characters, and considering cultural sensitivities, this initiative contributes to a more interconnected and harmonious global community. As we continue to navigate a world filled with diverse languages and cultures, projects like these serve as vital tools for communication and cooperation.

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