

Comparing cultural differences among Christianity and Hinduism based on their religious texts

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ABSTRACT

The Bhagavad Gita and the Bible are two of the most influential texts in Hinduism and Christianity, respectively. While both texts contain teachings on spirituality and morality, they also reflect the cultural differences between the two religions. This study aims to compare the cultural differences between Hinduism and Christianity as reflected in the Bhagavad Gita and the Bible using topic modeling.

To achieve this goal, we will use topic modeling techniques to analyze the texts of the Bhagavad Gita and the Bible. We will then compare the topics identified in each text to identify the cultural themes and differences between the two religions. This study will provide insights into the cultural differences between Hinduism and Christianity as reflected in the Bhagavad Gita and the Bible, and contribute to our understanding of the teachings and values of these religions. It will also demonstrate the usefulness of topic modeling as a tool for analyzing religious texts and identifying cultural themes.

We anticipate that the results of this study will be of interest to scholars and researchers in the fields of religion, cultural studies, and text mining.

1 INTRODUCTION

The Bhagavad Gita and the Bible are two of the most influential religious texts in the world, representing the foundations of Hinduism and Christianity, respectively. Despite their common origins in the ancient Near East, these two religions have developed distinct cultures and practices over the centuries. In this paper, we aim to understand the current cultural differences between Hinduism and Christianity by comparing the Gita and the Bible using text mining and topic modelling techniques.

Earlier, reading the religious texts and generating conclusions was long tiring process. However, computer analysis of text is very fast. As a result, entire books can be processed producing quantitative data that can be analyzed. While the analysis is not as rich or deep, it is broader and can be revealing in its breadth and its quantitative nature. Over the last two decades, automatic text processing has improved in part because of the growth in availability of digitized text. [6]

Text mining is a process of extracting valuable information and insights from large amounts of text data. By analyzing the words and phrases used in the Gita and the Bible, we can identify patterns and trends that may not be immediately apparent to the naked eye.

Topic modelling is a machine learning technique that helps to identify the main themes and topics present in a given text, allowing us to focus on the key ideas and concepts present in these religious texts.

By comparing the Gita and the Bible using these techniques, we hope to shed light on the cultural differences between Hinduism and Christianity, and to better understand how these differences have evolved over time. This understanding can help to bridge the gap between these two religions and promote greater understanding and harmony between their followers.

We believe that this comparison is especially relevant in today's increasingly globalized and interconnected world, where people of different faiths and backgrounds are brought into closer contact with one another. By better understanding the cultural differences between the Gita and the Bible, we cannot only deepen our own knowledge and appreciation of these texts, but also work towards a more harmonious and respectful coexistence between different religious traditions.

2 RELATED WORK

Chandra R, Ranjan M. Artificial intelligence for topic modelling in Hindu philosophy: Mapping themes between the Upanishads and the Bhagavad Gita. PLoS One. 2022 Sep 1;17(9):e0273476. doi: 10.1371/journal.pone.0273476. PMID: 36048840; PMCID: PMC9436095 provided the basic approach and the technique for the paper while we are innovating on paper as well

Vasantha Kumari Garbhupu, Prajna Bodapati, "Extractive Summarization of Bible Data using Topic Modeling," International Journal of Engineering modelingd Technology, vol. 70, no. 6, pp. 79-89, 2022. Crossref, <https://doi.org/10.14445/22315381/IJETT-V70I6P210> provided the basic approach and the technique for the paper while we are innovating on paper as well

3 APPROACH

3.1 Datasets

After evaluating prominent variations of The Bhagavad Gita and The Bible, we had to use different approaches. For the Gita, we use the older and more prominent texts in order to maintain the originality of the themes and the ideas. We ended up choosing Eknath Easwaran's translation since he had directly translated from Sanskrit to English.[2]

The Bhagavad Gita is a Hindu scripture that consists of 18 chapters, which contain a series of questions and answers on various topics, including the philosophy of Karma, between Lord Krishna and Arjuna.[4] The organization of the Gita is symbolic, as the

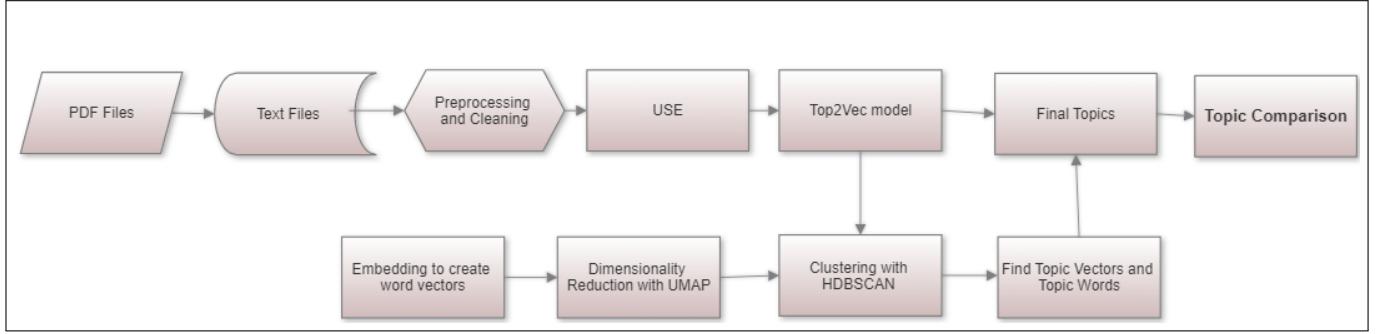


Figure 1: Topic Modelling Framework for comparing The Bhagavad Gita and The Bible

Mahabharata war, which is described in the text, lasted for 18 days. The Bible used for the research is The Holy Bible by DOUAY-RHEIMS VERSION 1609, 1582 that has been translated from the Latin Vulgate. The New Testament and Old Testament of the Bible were published in France in the 16th and 17th centuries. The New Testament was published at Rheims in 1582, and the Old Testament was published at Douay in 1609. This was the first Catholic Bible in English.[1]

The Bible is a collection of sacred texts or scriptures that are revered by Christians as the Word of God. The Bible is divided into two main sections: the Old Testament, which contains texts that are considered sacred by Jews and Christians, and the New Testament, which contains texts that are specifically important to Christians. The Old Testament includes texts such as the Hebrew Bible, the Torah, and the Prophets, while the New Testament includes texts such as the Gospels, the Acts of the Apostles, and the Epistles. The Bible is a central text for Christians, as it contains teachings and stories about the life and teachings of Jesus, and is believed to provide guidance and inspiration for Christian beliefs and practices.[5]

The data regarding the details of both texts is provided below:

Table 1: Details of the text used for Topic Modelling

Text	Translator	Year
The Bhagavad Gita	Eknath Easwaran	1985
The Bible	Douay-Rheims	1609,1582

3.2 Framework

Our major goal is to recognize\look into the cultural differences between the two religions and try to decipher them from the results we get using Topic modeling on their respective religious texts. To achieve this, we employ machine learning models for topic modeling. Fig 1 presents the complete framework for the analysis and topic modeling of the religious texts provided in Table 1. The first stage consists of conversion of the PDF files to text files and text pre processing which is discussed in later sections. In the second stage, we use Universal sentence Encode(USE) to generate fixed-length dense vector representations for natural language sentences and paragraphs which we can feed into machine learning Top2Vec model to generate topic clusters and perform semantic searches

for the specific cultural differences we have to search for. These generated word clouds and/or word frequency tables will be our results that we can use to validate the cultural differences between the two distinctive religions. See 1 for detailed view.

3.3 Text data extraction and processing

The Bible and The Bhagavad Gita had very different preprocessing steps though for the first stage the PDFs had to go through i.e. conversion to text files was the same. The PDFs for Bhagavad Gita were generated from scanned images of printed texts so we used ocr2text open-source library for optical character recognition(OCR). While we were able to find The Bible in a typed PDF format which could be changed to a text document easily. Next, preprocessing is performed on the documents, consisting of the following steps:

1. Removing Unicode characters generated due to noise in the PDF files.
2. Removing the archaic English words such as "thy" with modern english word your.
- 2.1 For Gita we had to substitute various words with their original meanings / names, for Arjuna there were too many variations like pandavas,Savyasachin and 13 other names while Krishna was called by 26 different names.
3. Lower casing the documents and removing punctuations and empty spaces.

3.4 Technical Details

In the framework, USE has been used for generating sentence embeddings. Then using UMAP we are able to reduce the dimensionality using the default n_components value of 15 and min_dist of 0.1 while also using the "cosine-similarity" as distance metric.[?] After dimensionality reduction of the document, we use HDBScan clustering algorithm. We set the parameters to default for the scan with min_cluster_size and min_samples to 5 and cluster_selection_method as 'eom'.[2]

3.5 Cultural differences

This subsection is an unique part of the research where using various resources, I could search for various cultural differences among Hinduism and Christianity which possibly be validated using the

results we garner from the research. Various differences that can be found among the two religions are:

- (1) The first difference comes in the views on salvation and the afterlife. Christianity believes in an afterlife where a person is sent to hell or heaven based on their deeds, while Hinduism believes in reincarnation based on "dharma", where soul is reborn in a new body after death which continues till the soul achieves moksha.[3] [5]
 - (2) Another differentiating factor would be in form of worships, where Hindus perform elaborate rituals and ceremonies for a vast number of deities guided by a priest in temples while Christians place a greater emphasis personal faith and individual relationship with God, and worships primarily in churches. .[3] [5]
 - (3) Even though both religions believe in the Holy Trinity of Christianity analogous to Trimurti in Hinduism, the concept differs with Christians believing Jesus Christ to be The Father, The son and The Holy Spirit contrary to Hindus beliefs of have three different gods-Brahma, Shiva, and Vishnu respectively..[3] [5]
 - (4) Christianity and Hinduism have a strong emphasis on compassion, love and helping others. Both religions also have a strong emphasis on the importance of family and community.[3] [5]

We can use these points to create keywords that will provide us with word clouds with the most similar words and thus help us certify the cultural differences.

- (1) "Soul"
 - (2) "Faith"
 - (3) "Jesus" for Christianity and "Krishna" for Hinduism
 - (4) "Love"

4 RESULTS AND ANALYSIS

After pre-processing the documents, we can generate the Frequency distribution of both the religious texts, see 2 and 3: These don't

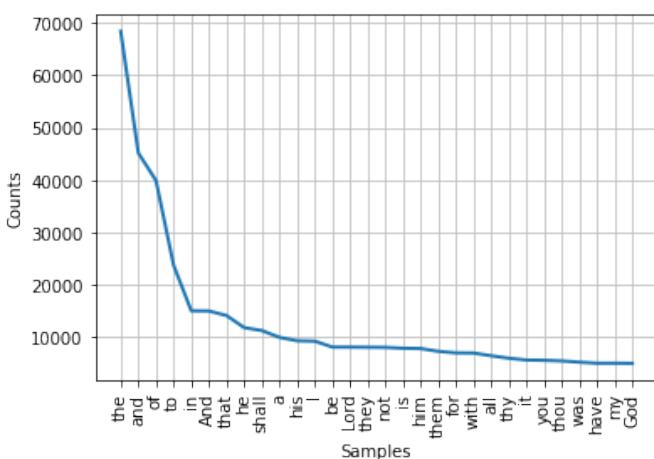


Figure 2: Frequency distribution of words in Bible

provide that much value to the validation but show the importance

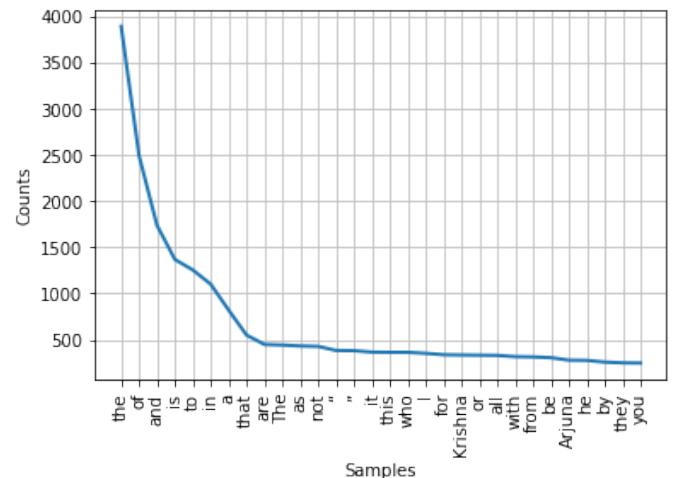


Figure 3: Frequency distribution of words in Gita.

of god figures in both the religious text with words like Lord and God appearing frequently in Bible and Krishna and Arjuna in Bhagavad Gita.

Moving on to Top2Vec model Bhagavad Gita produces a total of 51 topics while the Bible generates a total of 709 topics (This is due to the fact that we have taken both The Old testament and the New Testament). These topics are sorted on the basis of their frequency, hence topic 0 is the most frequent while last topic is the least. We can have a look at the top word clouds for the gita and bible to get a general idea.(see Fig.4 and Fig.5)



Figure 4: Word cloud0 for Gita

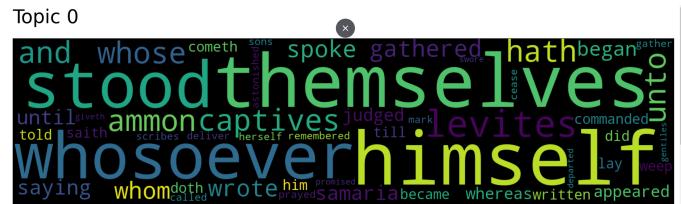


Figure 5: Word cloud0 for Bible

These word clouds give us an overall sense of context of the books. We can somewhat figure out the contexts of the books and relate them to our observations of the culture.

The topic 2 in Gita produced some interesting results with "Dharma",

Topic 2

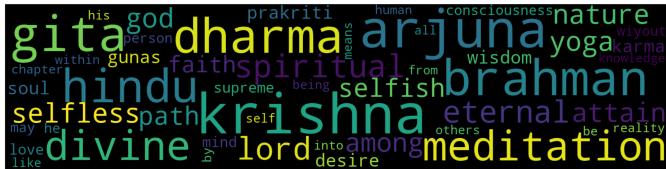


Figure 6: Word cloud2 for Gita

"Krishna", "Arjuna", "lord" under the same wordcloud.(see 6)

The bi-grams for both the books didn't seem to produce any significant results pertaining our research. So to focus on the cultural differences we can search for the specific keywords and compare those keywords for both the texts. For this we can select keywords from the Cultural differences and generate word clouds that resonate most with them.

- (1) For "Soul" the Gita generated wordclouds with topic scores of 0.58772402, 0.41727812, 0.37495318 for topic 9, 16 and 26 respectively. While for Bible the same keyword generated topic scores of 0.96065638, 0.61050682, 0.5200023 for topics 618, 48 and 504 respectively.

We will look at topic 16 and topic 504 to generate results (Fig 7 and 8).

Topic 16



Figure 7: Topic Score =0.41727812

Topic 504



Figure 8: Topic Score =0.5200023

- (2) For "Faith" wordcloud generated by Gita were 43,7,39 with topic scores of 0.77629121, 0.36741498, 0.3617124 respectively while Bible sorted topics 185, 332 and 606 with topic scores 0.75912321, 0.40018802, 0.36668261 respectively. We will look at topics 43 and 185.(Fig 9 and 10)

(3) For "Jesus" for Christianity and "Krishna" for Hinduism Bible gives the topics 554,577,293 a topic score of 0.67830594, 0.62021317, 0.59629747 with Gita providing a score of 0.99528179, 0.69567709, 0.59183053 for topics 36,1 and 30 respectively. We will look at topics 554 and 36(Fig 11 and 12):

Topic 43

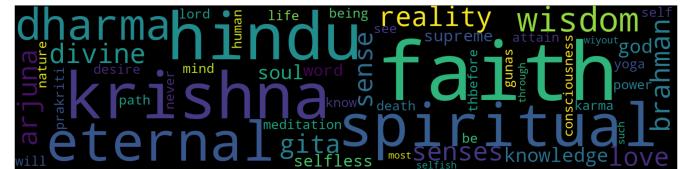


Figure 9: Topic Score =0.77629121

Topic 185



Figure 10: Topic Score = 0.75912321

Topic 554



Figure 11: Topic Score =0.67830594

Topic 36



Figure 12: Topic Score =0.99528179

- (4) "Love" should have a similar meaning in both the texts. Though Gita gets topics 7,20,36 with scores of 0.59224419, 0.40887127, 0.342817 while Bible produces topics 254, 293, 442 with scores of 0.5278013 , 0.5176332 , 0.51551691 respectively. We will look at topics 20 and 254(Fig 13 and 14):

4.1 Analysis

- (1) For the "Soul" we can see that words like prakriti(nature), attain, gunas(sins), sense , state , dharma have been used in Gita while Bible explains "Soul" with death, die, died.This backs up our cultural comparison.
 - (2) For the keyword "Faith" we can see words like Krishna, arjuna, brahaman (representing the various gods) in Gita while Bible has words like trust, prayed, forsake and saviour which again follows up with our cultural prediction.

Topic 20

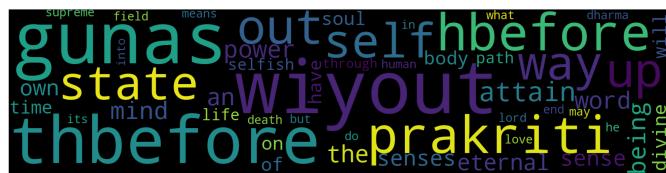


Figure 13: Topic Score =0.40887127

Topic 254



Figure 14: Topic Score =0.5278013

- (3) For "Jesus" in Bible we are treated with words like saviour, father, son (The Holy Trinity) believing in one god while in Gita for "Krishna" we get words like arjuna (Shiva), brahma (brahma), Krishna (Vishnu) forming the "Trimurti" of Hindu mythology.
 - (4) The wordcloud formations for the Gita seem to be random and cant be deciphered easily, though for Bible the cloud has words like good, great, wonderful but we cant end up on the desired result that we had prophecised.

5 DISCUSSION AND OUTLOOK

The topic similarity between The Bhagavad Gita and The Bible was highly surprising. Even though the book have been written for different cultures in different time periods, the core ideas have remained the same. The high semantic level of both the texts prove a lot difficult to process and led to a lot of things being kept in the dark. More work should be needed to convert the Bible into modern English version without deteriorating the meaning of the original. Various approaches that did not work out included the word clouds of the most frequent words. This was mainly caused due to improper preprocessing as due to time restraints i was unable to completely translate the Bible. Another interesting negative result came from the bigrams which were supposed to show interesting word combination but had the most common word tuples like "Krishna says", "no longer", "in fact". Along with it, taking both the testaments for the bible proved the bigram generation to be a huge task and I wasn't able to get any results out of it.

Except these, the approach seems to have obtained the desired results and one can easily use the word clouds to decipher the core ideas behind the cultural contrast of the two religions. The sources for this contrast were skewed. But, having the basic general ideas of the comparisons, one is able to reproduce the research and generate their results using the analysis and the code.

For further development on this research, I would recommend separating the Bible into its two respective parts while also taking into account the Upanishads for the Hindu culture. This will provide a

wide enough base for the comparison. The bigram results seem to have not worked properly for my case. But a further development into correct alternatives would provide a much better result in that aspect.

ACKNOWLEDGMENTS

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