

Project Proposal ENPM 703

Team Name: **Robotech Terps**

Team members: **Suraj Kalwaghe** | **Tanmay Pancholi** | **Kirti Kishore**
 UID: 120417638 UID: 120116711 UID:120148286

Project Title:

Harnessing Deep Learning for Life Guidance from Ancient Hindu Vedas: A Supervised Learning Approach Using NLP and Visual LLM

Project Proposal:

The problem we are investigating is how to create an AI model that derives insights from ancient Hindu Vedic scriptures to offer personalized life guidance on topics such as diet, sleep, and auspicious activities, based on Vedic wisdom. This task is particularly intriguing as it attempts to connect centuries-old knowledge with modern AI technology, using deep learning to interpret and apply Vedic teachings to contemporary life. Such a model would not only preserve and digitize cultural heritage but also make it accessible for practical use, enabling people to engage with ancient literature in an interactive and personalized manner. For background, we will explore traditional Vedic texts alongside contemporary work on NLP models, particularly those focusing on religious or philosophical texts.

The data for this project will be sourced from digital versions of the Vedas and other ancient Hindu scriptures, collected from verified online repositories to ensure the quality and accuracy of Sanskrit translations. We plan to implement a supervised learning approach, utilizing language models like Visual LLM and integrating them with LangChain for improved context understanding. Existing NLP frameworks will be adapted to address the unique linguistic structures and semantic richness of the Vedas. A significant challenge will be translating complex Vedic concepts into advice relevant to modern users, requiring innovative architectural designs and training strategies.

For evaluation, we will assess the model's ability to generate accurate, meaningful life guidance based on the Vedas and measure its interpretability. Qualitatively, we aim to generate visualizations such as word embeddings and topic models to analyze the semantic structure of the texts. Quantitatively, we will employ metrics like accuracy, precision, and user feedback to evaluate the model's ability to provide consistent and valuable recommendations. Through these methods, we hope to develop a model that is both culturally authentic and practically useful for life guidance applications.

Relevant research:

- A study using AI for topic modeling in Hindu scriptures like the *Bhagavad Gita* and *Upanishads* employs advanced models like BERT to analyze key themes across these texts, providing insights into metaphors, emotions, and philosophical teachings (e.g., karma yoga) and comparing various translations to ensure consistent meaning.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0273476>

- A study examined the use of word embeddings such as Word2Vec and GloVe for Sanskrit texts, revealing their effectiveness in maintaining linguistic richness and contextual similarity. This research could inform your model's understanding of Sanskrit's complex structure, enhancing the representation of Vedic texts.

<https://ar5iv.labs.arxiv.org/html/2104.00270>

- A research involving the Bible and Quran shows that using a large corpora of religious texts for natural language processing (NLP) is common for tasks like machine translation, sentiment analysis, and topic modeling.

<https://ar5iv.labs.arxiv.org/html/2404.14740v1>

- A research applies NLP techniques like BERT for analyzing Bhagavad Gita translations, focusing on sentiment analysis and the challenges of working with ancient texts.

<https://ar5iv.labs.arxiv.org/html/2201.03115>

- The attached repository provides a tool that compares various religious texts, including the Rig Veda and Bhagavad Gita, using NLP methods such as Word2Vec and sentiment analysis. It includes methods for comparing text chapters based on similarity scores, which could be adapted for your project when analyzing and structuring Vedic guidance.

https://github.com/cmaroti/nlp-religious-texts/tree/master/text_comparison_app