Ontology Creation for Digitally Expressed Feelings (Emotions) + Knowledge Graphs

1. Introduction

The vast amount of digital communication today makes understanding human emotions crucial for various applications. This project aims to develop a comprehensive ontology for emotions expressed digitally and integrate it into a knowledge graph framework. This will enhance our ability to interpret and respond to human emotions in the digital world, leading to advancements in sentiment analysis, social media mining, and personalized recommendation systems.

2. Objectives

- Goal 1: Building a Robust Ontology: We will design a detailed ontology framework that captures the complexities of digitally expressed emotions. This framework will consider various emotion theories, paradigms, and contextual factors.
- Goal 2: Knowledge Graph Integration: The developed ontology will be integrated into a knowledge graph framework. This will establish meaningful relationships between emotion concepts, contextual factors, and other relevant entities.
- Goal 3: Validation and Assessment: We will validate the effectiveness of the developed ontology and knowledge graph through real-world use cases. This will ensure their semantic accuracy, inference capabilities, and practical utility.

3. Methodology

- Week 1: Literature Review and Ontology Design

We will conduct a thorough review of existing research in emotion ontologies, psychology, sentiment analysis, and knowledge graph technologies. This will inform the development of our ontology. Key emotion theories, paradigms, and contextual factors relevant to digitally expressed emotions will be identified.
Based on the literature review and identified requirements, we will design a comprehensive ontology framework encompassing various dimensions of digitally expressed emotions, extending upon existing work.

- Week 2: Ontology Implementation and Knowledge Graph Integration

We will implement the designed ontology using ontology modeling tools and standards like RDF, OWL, and Protégé to ensure formalization and semantic interoperability.
A basic knowledge graph framework will be developed using semantic web technologies to facilitate the integration of the emotion ontology.
The developed ontology will be integrated into the knowledge graph framework, establishing relationships between emotion concepts, contextual factors, and other relevant entities.

- Week 3: Validation and Evaluation

The effectiveness of the ontology and knowledge graph will be evaluated through empirical testing against real-world datasets and use cases. We will assess performance metrics like accuracy, completeness, and scalability. We will solicit feedback from peers, professors, and teaching assistants to evaluate the practical utility and effectiveness of the developed ontology and knowledge graph. The validation process will be documented, highlighting strengths, limitations, and potential areas for improvement.

4. Conclusion

This project addresses the growing need for effective modeling of digitally expressed emotions. By creating a comprehensive ontology and integrating it into a knowledge graph framework, we aim to contribute to the advancement of AI applications for understanding and analyzing human emotions in digital contexts. We are committed to achieving significant progress and laying the groundwork for future research and development in this critical area, despite the condensed timeline.

5. References

Park, E. H., & Storey, V. C. (2023). Emotion Ontology Studies: A Framework for Expressing Feelings Digitally and its Application to Sentiment Analysis. ACM Computing Surveys, 55(9), 1–38. https://doi.org/10.1145/3555719