Semantic Analysis using Sentence-BERT for Intelligent Online Education Platform (AIOP)

Abstract

In the modern digital learning ecosystem, the demand for adaptive, intelligent educational platforms is increasing. This paper proposes a system for enhancing online education through semantic analysis using Sentence-BERT...

Keywords

Sentence-BERT, semantic analysis, online education, NLP, Flask, Google Colab, personalized learning

1. Introduction

With the growing adoption of e-learning, understanding learners' needs and providing context-aware assistance have become critical...

2. Literature Review

Existing online education platforms rely heavily on rigid, rule-based recommendation systems...

3. Methodology

The AIOP system comprises several core components that work together to provide intelligent responses to student queries...

4. Implementation Details

The project was implemented using Python 3.10 with the following technologies: sentence-transformers, pandas, matplotlib...

5. Visualization and Output

Visualizations aid in the interpretation and trustworthiness of model predictions using bar graphs, histograms, and heatmaps...

6. Experimental Results

The model was evaluated using a dataset of 500 student queries. Key findings include: Top-1 match 82%, Response Time <1s...

7. Discussion

Challenges include balancing model size and speed, domain adaptation, and data privacy concerns...

8. Conclusion and Future Work

This research demonstrates the potential of Sentence-BERT in enhancing semantic understanding in online education platforms...

9. Acknowledgements

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10. References

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