Thesis Evaluation System 📚

A comprehensive AI-powered tool designed to analyze and evaluate academic thesis documents through advanced natural language processing, machine learning, and rule-based evaluation techniques.

🌟 Key Features

- **Comprehensive Section Analysis**

    - Structure & Grammar evaluation

    - Introduction assessment

    - Literature Review analysis

    - Research Methods evaluation

    - Experiment Implementation review

    - Results Analysis

    - Conclusion assessment

    - Citations & References verification

- **AI-Enhanced Evaluation** powered by OpenAI's language models

- **Interactive Visualization** through Streamlit interface

- **Multilayered Scoring** with detailed quality insights
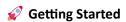
🛠 Technologies

- **Core**: Python

- **NLP**: spaCy, language_tool_python

- **AI**: OpenAI GPT

- **Frontend**: Streamlit

- **Visualization**: Plotly

- **Document Processing**: PyMuPDF

🚀 Getting Started

Prerequisites

- Python 3.8 or higher

- OpenAI API key

- Git

Installation
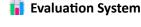
1. Clone the repository:

2. git clone https://github.com/pankil-soni/thesis-evaluation-system.git

3. cd thesis-evaluation-system

4. Create and activate virtual environment:

5. python -m venv venv

6. # On Windows

7. venv\Scripts\activate

8. # On macOS/Linux

9. source venv/bin/activate

10. Install dependencies:

11. pip install -r requirements.txt

12. Download spaCy model:

13. python -m spacy download en_core_web_sm

14. Configure OpenAI API:

15. # Create .env file and add your API key

16. echo "OPENAI_API_KEY=your_api_key_here" > .env

Usage

Start the application:

streamlit run app.py

📊 **Evaluation System**

Methodology

The evaluation process combines multiple approaches:

1. **Rule-Based Analysis**

   o Grammar and structure verification

   o Pattern matching

   o Language quality checks

2. **AI Analysis**

   o Contextual understanding via OpenAI GPT

   o Semantic section analysis

   o Qualitative feedback generation

3. **Visualization**

   o Interactive score displays

   o Section-wise performance radar charts

   o Detailed feedback presentation

Project Structure

```
thesis-evaluation-system/
├── app.py                # Main Streamlit application
├── evaluator.py          # Base evaluation class
├── evaluators/
│   ├── structure_evaluator.py
│   ├── introduction_evaluator.py
│   ├── literature_review_evaluator.py
│   ├── research_methods_evaluator.py
│   ├── experiment_implementation_evaluator.py
│   ├── results_analysis_evaluator.py
│   ├── conclusion_evaluator.py
│   └── citation_references_evaluator.py
├── requirements.txt
└── README.md
```

🤝 Contributing

1. Fork the repository
2. Create your feature branch (git checkout -b feature/AmazingFeature)
3. Commit changes (git commit -m 'Add AmazingFeature')
4. Push to branch (git push origin feature/AmazingFeature)
5. Open a Pull Request

📄 License

This project is distributed under the MIT License. See LICENSE for more information.
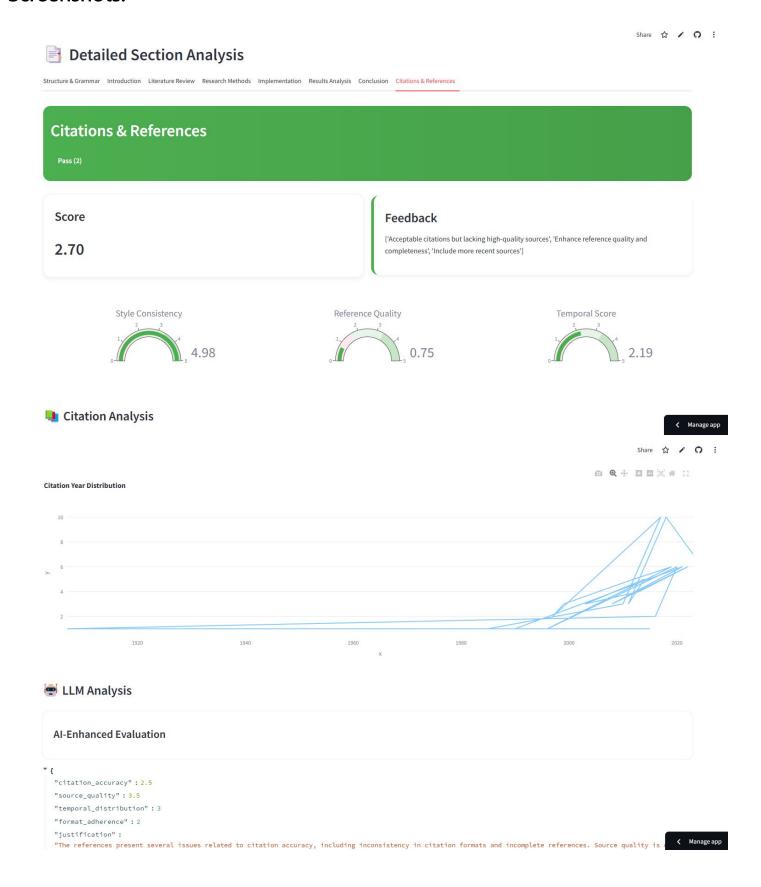
📧 Contact

Project Maintainer: [Pankil Soni](#)

Project Link: https://github.com/pankil-soni/thesis-evaluation-system

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Note: Ensure all dependencies are properly installed and API keys are configured before running the application.

Screenshots:

📄 **Detailed Section Analysis**

Structure & Grammar   Introduction   Literature Review   Research Methods   Implementation   Results Analysis   Conclusion   Citations & References

Citations & References

Pass (2)

Score

2.70

Feedback

['Acceptable citations but lacking high-quality sources', 'Enhance reference quality and completeness', 'Include more recent sources']

Style Consistency
4.98

Reference Quality
0.75

Temporal Score
2.19

📚 **Citation Analysis**

◀ Manage app

Citation Year Distribution

🤖 **LLM Analysis**

AI-Enhanced Evaluation

```
{
    "citation_accuracy" : 2.5
    "source_quality" : 3.5
    "temporal_distribution" : 3
    "format_adherence" : 2
    "justification" :
    "The references present several issues related to citation accuracy, including inconsistency in citation formats and incomplete references. Source quality is
```

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Score

8.93

Feedback

['Basic review with incomplete systematic approach', 'Improve temporal distribution of sources']

📊 Review Analysis

Systematic Review Score

6.63

📊 Citation Metrics

```
{
    "total_citations" : 44
    "unique_citations" : 43
    "citation_styles" : 2
    "years_range" : 33
    "recency_score" : 0.75
    "temporal_distribution" : 0.21
}
```

🔍 Evidence Analysis

Evidence Distribution

🔄 Coherence Analysis

Coherence Score

10

🤖 LLM Analysis 🔗

```
{
    "problem_score" : 7
    "questions_score" : 7.5
    "objectives_score" : 8
    "justification_score" : 8
    "justification" :
    "The thesis introduction covers a complex intersection of philosophy, sacred texts, and modern AI methodologies, providing a detailed background and clear
    objectives. However, it lacks precision in defining the problem scope and misses explicit statements identifying research gaps."
    "strengths" : [
        0 : "Comprehensive background on the philosophy of religion and Hindu sacred texts."
        1 : "Clear articulation of the objectives that align with the research question."
        2 : "Innovative application of AI techniques to a classical religious text, which is of significant scientific and practical potential."
        3 : "Detailed project justification outlining both scholarly and broader societal impacts."
    ]
    "improvements" : [
        0 : "The problem statement could be expanded with more context on the existing research landscape and specific gaps."
```

Introduction

Merit (6)

Score

6.51

Feedback
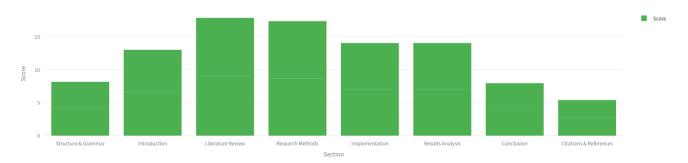
['Well-written but some components need improvement']

🎯 Component Scores

Component Analysis

📈 Key Metrics Visualization

Scores by Section

■ Score

Section

Sections: Structure & Grammar, Introduction, Literature Review, Research Methods, Implementation, Results Analysis, Conclusion, Citations & References

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Sections

📥 Detailed Report

| 📥 Download CSV Report | 📥 Download Excel Report |

📊 Detailed Metrics

	Section	Score	Grade	Feedback
0	Structure & Grammar	4.08	Distinction (4)	
1	Introduction	6.51	Merit (6)	['Well-written but some components need improvement']
2	Literature Review	8.93	Pass (8)	['Basic review with incomplete systematic approach', 'Improve temporal distribution of sources']
3	Research Methods	8.68	Fail (5-9)	['Methodology is poorly articulated or inappropriate']
4	Implementation	7.02	Fail (5-9)	['Basic implementation with insufficient detail', 'Implementation needs more detailed explanations']
5	Results Analysis	7.02	Fail (4-7)	['Discussion is unsatisfactory and lacks critical depth', 'Improve critical thinking and evidence-based argume
6	Conclusion	3.98	Fail (3-4)	['Inadequate conclusions and recommendations']
7	Citations & References	2.7	Pass (2)	['Acceptable citations but lacking high-quality sources', 'Enhance reference quality and completeness', 'Inclu
8	Structure & Grammar	4.08	Distinction (4)	
9	Introduction	6.51	Merit (6)	['Well-written but some components need improvement']

📈 Key Metrics Visualization

Scores by Section

[◀ Manage app]

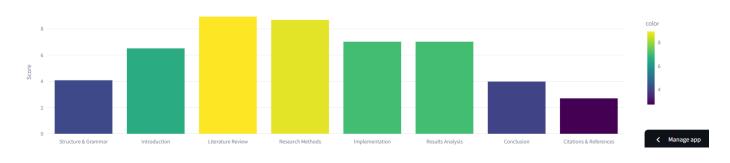## 📋 Found Sections

```
[
  0 : "abstract"
  1 : "introduction"
  2 : "methodology"
  3 : "results"
  4 : "discussion"
  5 : "conclusion"
  6 : "references"
]
```

📈 Comparative Analysis

Score Distribution Across Sections

[◀ Manage app]

📝 Detailed Section Analysis

Structure & Grammar   Introduction   Literature Review   Research Methods   Implementation   Results Analysis   Conclusion   Citations & References

Structure & Grammar

Distinction (4)

Score

4.08

Feedback

📝 Structure Details

Structure Score	Formatting Score	Grammar Score	Style Score
3.5	3.75	4.91	4.11

48.92	0.12	4/8	Pass

📊 Overall Performance Analysis

📷 🔍 ⛶

Section Scores Distribution

📝 Detailed Section Analysis

Structure & Grammar   Introduction   Literature Review   Research Methods   Implementation   Results Analysis   Conclusion   Citations & References

Structure & Grammar

⚙️ Configuration

🔴 Use LLM for Enhanced Evaluation

About

This enhanced system provides comprehensive thesis evaluation with:

- Detailed section analysis
- Interactive visualizations
- AI-enhanced feedback
- Comparative analytics
- Downloadable reports

🎓 Thesis Evaluation System

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[Browse files]

📄 AI ML Thesis Report.pdf 1.3MB   ✕

📊 Overall Evaluation Dashboard

Total Score	Average Score	Passing Sections	Overall Grade
48.92	**6.12**	**4/8**	**Pass**

📊 Overall Performance Analysis

Section Scores Distribution

Literature Review

Research Methods   Introduction

[Manage app]