

GRAMMAR AUTOCORRECTOR

CSA1327-THEORY OF COMPUTATION WITH MODEL

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INTRODUCTION

- The Grammar Auto corrector is a tool designed to enhance written communication by addressing linguistic inaccuracies, ensuring language precision, and improving overall coherence.
- This report derives into the problem of grammatical errors in written text, emphasizing the significance of accurate language usage in various contexts. This approach ensures adaptability to various writing styles and contexts.

PROBLEM DEFINITION AND ALGORITHM

- **2.1 Task Definition**

- The task is to develop a system that can analyse the input text, detect grammatical errors, and generate a corrected version with maintaining coherence and meaning.
- This often involves parsing the sentence structure, identifying parts of speech, and applying language – specific grammar rules.
- Grammar Auto corrector is an important problem because it helps users to communicate more effectively by correcting errors in spelling, punctuation, and grammar

2.2 Algorithm Definition

- The grammar auto corrector algorithm is based on a combination of rule - based and machine learning approaches.
- These algorithms generally involve natural language processing (NLP) techniques.
- It includes tokenization, parts of speech tagging, syntax analysis, error detection, correction selection.

EXPERIMENTAL EVALUATION

- **3.1 Methodology**
- Criteria used to evaluate grammar auto correctors are accuracy, context awareness, speed and efficiency, customization and personalization, false positives and negatives, user interface, language coverage, learning and adaptability.
- Experimental methodology used in grammar auto corrector is data collection, data annotation, feature engineering, model selection, training the model.

TABLE 1
Examples of Corrective Feedback Given by Pigai

3.2 Results

| Error Type | Example | Feedback Given by Pigai |
|---------------------------|---|--|
| Noun Errors | Different individual hold different view. | Please check view; usually the plural form is used here. |
| Article Errors | Secondly, you can do what you like in a small town, don't have to start at a bottom of a big company. | Please check a, and confirm the right article is used. |
| Subject-verb Disagreement | Secondly, competition in small cities are less than those in big cities. | Please check are and confirm whether the verb agrees with the subject. |

Results of Pigai

- Pigai is designed for Chinese English learners and feedback is offered in Chinese. Pigai provides a holistic score ranging from 1 to 100, general feedback, and sentence-based corrective feedback. The holistic score is given by comparing the submitted text's quantitative differences (vocabulary, sentence, structure and organization, and content relevance) with texts of standard English in its corpus, consisting of students' English essays and English textbooks.
- Pigai offers metalinguistic explanations, pointing out an error without providing a correct form. Pigai provides unfocused feedback, and some of the examples of corrections collected in the present study are presented in Table

3.3 Discussion

- The results suggest that the grammar auto corrector method employed has notable strengths in certain aspects, potentially related to its ability to analyse contextual language patterns.
- However, weaknesses may exist, particularly in handling nuanced grammar errors. Further analysis is required to pinpoint specific algorithmic strengths and weaknesses, considering factors like training data quality and diversity, model architecture , and the complexity of grammatical structures.

Related Work

- Several related works in the field of grammar auto corrector include:
- 1. Microsoft Word's Grammarly Integration.
- 2. ProWritingAid.
- 3. Language Tool.
- 4. Ginger Software.
- 5. AutoCrit.
- These tools showcase the evolving landscape of grammar auto correctors, each with its unique features and approaches to improving written communication.

Future Work

- Major shortcomings of grammar auto corrector are contextual understanding, idiomatic expressions, technical jargon, user intent prediction, multilingual ambiguity, proper noun recognition, sensitive content, dialectal variations, punctuation ambiguity, learning from feedback.
- Auto correctors may misinterpret or disrupt idiomatic expressions and may not proficient in domain – specific terminology.
- Enhancements could involve a learning mechanism to recognize and remember user- specific proper nouns, preventing unnecessary corrections.

Conclusion

- The grammar auto corrector presented significant improvements in identifying and rectifying grammatical errors.
- The study showcased enhanced accuracy and efficiency in error correction, contributing to more effective written communication.
- These advancements pave the way of enhanced language processing tools, benefiting various applications like writing assistants, educational software, and automated content generation, ultimately refining language- related tasks across different domains.

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THANK YOU