Sample Research Report

Abstract

This paper investigates the use of pushdown automata (PDA) in validating structural correctness of research reports. The approach ensures proper nesting of sections, balanced delimiters, and grammatical consistency. However, some limitations exist (see Figure 1).

1. Introduction

Research writing requires rigor, clarity, and structural correctness. Reports must ensure that sections are well-nested, citations are properly balanced, and conclusions logically follow from results.

2. Methodology

We implemented a PDA-based analyzer. The PDA validates delimiters such as (), {}, [], and quotation marks. Additionally, IF/ELSE/ENDIF blocks within pseudocode are verified for correct nesting. Symmetry of phrasing around conjunctions such as 'and' is also analyzed.

3. Results

The analyzer successfully detected mismatched parentheses in test cases and identified asymmetry in conjunction-based structures. However, some edge cases (e.g., nested 'and/or' phrases were challenging).

4. Conclusion

Our findings show that PDA models are powerful for detecting structural inconsistencies in reports. Future work includes extending the analyzer to handle semantic checks and deeper NLP integration.

References

[1] Hopcroft, J. E., & Ullman, J. D. (1979). Introduction to Automata Theory, Languages, and Computation.
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[3] (MISSING REFERENCE