Plagiarism Checking

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Introduction

Academic plagiarism is one of the severest forms of research misconduct and has negative impacts on academia and the public. Plagiarized research papers distort scientific processes and can affect future research and practical applications.

Consequences of Plagiarism

- Distortion of results in meta-studies, threaten the patient safety in fields like medicine.
- Wasting resources and requiring extensive review efforts.
- Undue career advancements and funding based on plagiarized work.

Plagiarism in Education

Plagiarism eat away the competence acquisition in education, reducing motivation for students to learn and acquire knowledge. It distorts the assessment of academic abilities and leads to undeserved career benefits.

Role of Information Technology

The rapid advancement of IT has made plagiarism easier while also facilitating its detection. Automated plagiarism detection is now a rapidly evolving research field.

Paper Selection Criteria

We focused on:

- Plagiarism detection for text documents.
- Exclusion of policy and educational issues.
- Exclusion of papers addressing other types of plagiarism (e.g., source code, images).

Related Literature Reviews

Various reviews have been conducted on plagiarism detection methods, including the following:

- Review of text-based methods.
- Plagiarism detection systems overview.
- Typologies and classifications of plagiarism.

Types of Plagiarism

Walker's typology distinguishes various types:

- Sham paraphrasing (express something again using different words).
- Illicit paraphrasing.
- Verbatim copying.
- Self-plagiarism (recycling).

Plagiarism Detection Approaches

Plagiarism detection methods can be categorized as:

- Syntax-based methods.
- Semantics-based methods.
- Hybrid methods combining both approaches.

Syntax-Based Methods

Syntax-based methods focus on sentence-level analysis, using Part-of-Speech (PoS) tagging and syntactic structures to detect similarity. These methods often help reduce ambiguity in lemmatization and stemming.

Semantics-Based Methods

Semantics-based methods focus on the meaning of the text. They use techniques such as:

- Word embeddings.
- Latent Semantic Analysis.
- Explicit Semantic Analysis.

These methods are crucial for detecting obfuscated plagiarism.

Latent Semantic Analysis (LSA)

LSA analyzes the underlying semantic structure of texts by reducing the dimensionality of a term-document matrix using Singular Value Decomposition (SVD), capturing semantic relationships between terms.

Explicit Semantic Analysis (ESA)

ESA uses external corpora to capture the semantic context of words, allowing for comparison of texts based on their underlying meaning, even if phrasing is altered.

Hybrid Methods

Hybrid methods combine syntax-based and semantics-based approaches. By leveraging both syntactic and semantic features, these methods improve detection accuracy, especially for more complex forms of plagiarism.

Plagiarism Detection Systems

Plagiarism detection systems integrate various computational methods and can:

- Identify instances of verbatim copying.
- Detect paraphrasing and obfuscated plagiarism.
- Classify different types of plagiarism based on severity.

Tools for Plagiarism Detection

Tool	**Detection Method**	**Key Features**
Turnitin	Text Matching	Checks academic papers against a database of student papers, academic journals, and websites.
Copyscape	Web-based Matching	Detects plagiarism on the web, often used by content writers and bloggers.
Plagscan	Text Matching	Scans against scholarly databases and publications; integrates with academic systems.
Grammarly	Syntax and Semantics	Provides grammar checks along with plagiarism detection by comparing texts against web sources.
Quetext	Semantic	Offers deep search functionality by detecting paraphrasing and rewriting techniques.
DupliChecker	Web-based Matching	Free tool for quick plagiarism checks, supporting document uploads and text searches.

Conclusion

Plagiarism detection remains a dynamic research area, with significant advancements in computational methods. Continued research is needed to address emerging challenges such as obfuscation and cross-language plagiarism.