

The slide features a light blue background with several decorative elements. On the left, there are three hexagons: a large light blue one, a small dark green one, and a medium green one. On the right, there are large, overlapping blue geometric shapes that create a dynamic, abstract pattern. The text is positioned in the center-right area.

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Final Project
GEN AI

PROJECT TITLE



Statistical Autocorrect System

AGENDA

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- WHO ARE THE END USERS?
- YOUR SOLUTION AND ITS VALUE PROPOSITION
- THE WOW IN YOUR SOLUTION
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PROBLEM

STATEMENT

The problem statement of the **statistical autocorrect** system project revolves around the need to address textual errors, including misspellings, typos, and grammatical inconsistencies, which are ubiquitous across various digital platforms. The project aims to develop an intelligent solution that can automatically detect and correct these errors to enhance the accuracy and clarity of written communication. Leveraging statistical techniques and natural language processing (NLP) methods, the proposed solution seeks to provide users with a seamless and efficient autocorrection mechanism that improves the quality of textual input across diverse applications.



PROJECT OVERVIEW

The aim of the statistical autocorrect system project is to develop a robust algorithm capable of automatically detecting and correcting textual errors such as misspellings, typos, and grammatical inconsistencies. Leveraging statistical techniques and natural language processing (NLP) methods, the project seeks to enhance the accuracy of textual input by estimating word probabilities and considering the context of preceding words through bigram probabilities. Ultimately, the project aims to provide users with a seamless and efficient solution for improving textual accuracy across various platforms and applications.



WHO ARE THE END USERS?

Individuals: Everyday users of digital communication platforms such as smartphones, computers, and tablets who benefit from autocorrect functionality to enhance the clarity and correctness of their written messages.

Professionals: Writers, editors, and professionals in various industries who rely on written communication for their work, including emails, reports, documents, and presentations, to ensure professionalism and accuracy in their written content.

Students: Students at all levels of education who use autocorrect systems to improve the quality of their assignments, essays, and academic papers, enabling them to convey their ideas effectively and meet academic standards.

Language Learners: Individuals learning a new language who use autocorrect systems to identify and correct errors in their writing, aiding in language acquisition, grammar comprehension, and language proficiency development.

Individuals with Disabilities: People with dyslexia, visual impairments, or language difficulties who benefit from autocorrect systems as assistive technologies to overcome barriers in written communication and improve accessibility to digital platforms.

YOUR SOLUTION AND ITS VALUE PROPOSITION

Solution Overview:

Statistical Autocorrect System using Natural Language Processing

Value Proposition:

- **Enhanced Written Communication:** Our solution leverages advanced natural language processing techniques to automatically detect and correct textual errors, improving the clarity, correctness, and professionalism of written communication.
- **Time Savings:** Save time and effort spent on manual proofreading and editing tasks, enabling users to focus on content creation and critical tasks without worrying about typographical errors or grammatical mistakes.
- **Increased Productivity:** Boost productivity for writers, editors, and professionals by streamlining the error correction process and ensuring consistent, high-quality written content across digital platforms.
- **Accessibility and Inclusivity:** Promote accessibility and inclusivity by providing assistance with error detection and correction for users with dyslexia, visual impairments, or language difficulties, enhancing equitable access to digital communication tools.



THE WOW IN YOUR SOLUTION

Unparalleled Accuracy: Experience unparalleled accuracy in error detection and correction, ensuring the highest quality of written communication with minimal errors.

Seamless Integration: Seamlessly integrate the autocorrect system into existing digital platforms and communication tools, enhancing user experience and productivity without disrupting workflow.

Personalized Correction: Enjoy personalized correction suggestions tailored to individual writing styles and preferences, optimizing autocorrection effectiveness and user satisfaction.

Continuous Learning: Benefit from continuous learning and improvement of the autocorrect system through machine learning algorithms, language model updates, and user feedback, ensuring ongoing accuracy and relevance.

Empowering Accessibility: Empower users with disabilities to access and participate in digital communication effectively, promoting inclusivity and equal opportunities for all users.



MODELLING

Architecture:

- Utilizes a generator network to produce synthetic textual corrections and a discriminator network to differentiate between real and corrected text.
- The generator generates corrections from input textual errors, while the discriminator learns to distinguish between real and generated corrections.

Training Process:

- Adversarial training involves concurrent training of the generator and discriminator networks.
- The generator attempts to deceive the discriminator by producing convincing corrections, while the discriminator aims to accurately classify real and generated corrections.

Loss Functions:

- Binary cross-entropy loss is employed to train both the generator and discriminator networks.
- Discriminator loss assesses the discriminator's ability to distinguish between real and generated corrections.
- Generator loss evaluates the generator's success in producing realistic corrections to deceive the discriminator.

RESULTS

The statistical autocorrect system successfully detected and corrected textual errors with high accuracy, significantly improving the clarity and accuracy of written communication.

- **Discriminator Loss:** Evaluates the effectiveness of the discriminator network in distinguishing between real and fake textual errors during training, indicating the network's ability to discern genuine errors from artificially generated ones.
- **Generator Loss:** Measures the success of the generator network in producing realistic corrections for textual errors, reflecting its capability to deceive the discriminator by generating plausible corrections.
- **Error Detection Accuracy:** Represents the accuracy of the autocorrect system in identifying and correcting textual errors, providing insights into its effectiveness in improving the correctness and clarity of written communication.
- **User Satisfaction Metrics:** User feedback surveys and subjective evaluations are utilized to gauge user satisfaction with the autocorrect system, considering factors such as ease of use, accuracy of corrections, and overall user experience.

[DEMO LINK:](#)

<https://github.com/Abhinaya-cse/IBM-PROJECT-Gen-AI.git>