

**IMPROVE YOUR TEXTS INTO POWERFUL COMMUNICATION TOOLS
WITH CLASSIC TECHNIQUES
AND DEEP LEARNING**

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MOTIVATION AND INSPIRATION

- **The text highlights the need for efficient text summarization due to large amounts of online data**
- **It blends classical communication methods with deep learning to enhance message creation.**
- **Combining traditional techniques and modern algorithms improves content understanding.**
- **The fusion of old and new technologies leads to better, more effective communication.**
- **Comparisons of models like Gemini and ChatGPT show their strengths in text summarization**

OBJECTIVES

- Here is a more concise summary of the text:
- 1. Define text summarization's role in NLP and AI, emphasizing context preservation.
- 2. Show how statistical methods enhance summarization.
- 3. Combine classical and modern techniques for better communication.
- 4. Compare neural networks (Gemini, ChatGPT 3.5, 4.0) for summarization.
- 5. Highlight deep learning's impact on communication effectiveness.
- 6. Promote a strategy blending traditional methods with AI.
- 7. Conclude with key findings and future research directions.

RESUME PRESENTATION:

- Fundamentals
- Motivation and inspiration;
- Objectives;
- Examples;
- Conclusions;
- Future works.

FUNDAMENTALS TEXT SUMMARIZATION

- **Text Summarization** is the process of reducing a long text to a shorter version while preserving the essential information and main meaning. There are two main types of summarization: **extractive** and **abstractive**.
- **Extractive Summarization:** Selects the most important sentences from the original text and organizes them to form a summary. This type of summarization does not rewrite the content, it only extracts relevant parts.
- **Abstractive Summarization:** Generates a summary that rephrases the original content, producing a more compact and creative synthesis, which may include phrases not present in the original text.

BACKGONUD - TEXT SUMMARIZATION

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APPLICATIONS OF TEXT SUMMARIZATION

- **News and Journalism:** Helps readers quickly grasp events and headlines by providing news summaries.
- **Academic Research:** Allows researchers to quickly review available literature without reading entire documents.
- **Virtual Assistants and Chatbots:** Use summarization to synthesize large blocks of text, making interaction more efficient.
- **Social Media:** Summarization tools can help reduce long texts into concise posts for easy reading and sharing.
- **Legal Documents:** Summarizes lengthy legal texts to help quickly understand contracts, terms and conditions, and court rulings

CLASSICAL TEXT SUMMARIZATION TECHNIQUES

- Overview of traditional methods in text summarization, emphasizing rule-based approaches.
- Manual feature extraction and content filtering.

Limitations: Scalability issues, handling complex linguistic contexts.

DEEP LEARNING IN TEXT SUMMARIZATION

- • Advantages of using deep learning models (e.g., CNNs, RNNs, GPT, BERT).
- • Captures context and nuances in language, offering higher accuracy.
- • Benefits: High accuracy, adaptability to large datasets, and capability for abstract summarization.

PARAMETERS TO EVALUATE A GOOD SUMMARIZATION SUBJECTIVE)

- Relevance:** How well the summary preserves the most important information from the original text.
- Coherence:** The summary should be well-structured and easy to understand, with a logical sequence of ideas.
- Accuracy:** The information in the summary should be correct and not distort the original content.
- Coverage:** The summary should cover all the key points of the original text without omitting essential elements.
- Redundancy:** A good summary avoids unnecessary repetition of ideas or phrases.
- Length:** The proportion of the summary to the original text should be appropriate. It should be short enough to reduce reading time but long enough to preserve the essential content.
- Fluency:** The readability and clarity of the summary, which should be fluid and well-articulated.

ORIGINAL TEXT (EXAMPLE ONE, ROBOTICS IS THE SCIENCE).

- Robotics is the science that studies the technologies associated with the design and construction of robots.
- Robots are automatic mechanisms that use integrated circuits to perform simple or complex human activities and movements. Robotics has wide application in several areas, from industrial production, medicine to domestic activities. The concept of robotics emerged at the beginning of the 20th century, in the work “The Liar” by science fiction author Isaac Asimov. It was the author who created the word ‘robotics’ and it was also he who presented, in the field of science fiction, the Laws of Robotics.

EXAMPLE 01 RESULTS

With this classic technique, the text would look like:

"Robotics, the science of technologies for designing and building robots, has wide applications in industrial, medical, and domestic activities. The concept emerged in the 20th century in the work "The Liar" by Isaac Asimov, author of science fiction, who also introduced the Laws of Robotics."

Resume by deep learning 1 Microsoft (ChatGPT 3.5 free)

"Robotics studies technologies to create robots, automatic mechanisms that perform human tasks. It has applications in production, medicine, and domestic activities. The concept emerged at the beginning of the 20th century in work "The Liar" by Isaac Asimov, the author who also created the word "robotics" and the Laws of Robotics in science fiction".

Resume by deep learning2 (Gemini free – Google free):

"Uncovering the World of Robotics: Robotics presents itself as a fascinating science that explores the creation and development of autonomous machines capable of performing everything from simple tasks to complex movements that imitate humans. These mechanisms come to life through integrated circuits and become valuable tools in several areas".

Resume by Deep Learning 3 Microsoft (ChatGPT4o)

"Robotics is the study of technologies for designing and building robots, automatic mechanisms that employ integrated circuits to perform everything from simple tasks to complex movements without direct human intervention. With extensive applications in sectors such as industrial production, medicine, and domestic tasks, robotics is a discipline that emerged at the beginning of the 20th century, as highlighted by the work "The Liar" by Isaac Asimov, a pioneer of science fiction."

ORIGINAL TEXT (EXAMPLE TWO, THE MYTH OF THE CAVE)

The myth tells about prisoners (since birth) who live trapped in chains in a cave and who spend all their time looking at the back wall, which is illuminated by the light generated by a fire. Shadows of statues representing people, animals, plants, and objects are projected onto this wall, showing everyday scenes and situations. The prisoners keep giving names to the images (shadows), analysing and judging the situations. Let us imagine that one of the prisoners was forced to escape his chains to explore the cave and the outside world. He would get in touch with reality and realize that he spent his entire life analysing and judging only images projected by statues. When leaving the cave and meeting the real world, I would be enchanted by real beings, nature, animals, etc. He would return to the cave to pass on all the knowledge acquired outside the cave to his colleagues who were still trapped. However, he would be ridiculed when he told everything he saw and felt, as his colleagues can only believe in the reality they see on the illuminated wall of the cave. The prisoners will call him crazy, threatening him with death if he does not stop talking about those ideas considered absurd. Prisoners in the cave since birth, chained and limited to the perception of shadows on the wall (symbolizes ignorance and limitation of sensory knowledge). Awakening and Search for Truth: A freed prisoner explores the cave and the outside world, discovering actual reality (represents the search for knowledge and philosophy). The prisoner returns to the cave to share his knowledge but is ridiculed and misunderstood by the other prisoners (evidence resistance to change and attachment to preconceived beliefs).: The myth serves as a metaphor for the human condition, trapped in one's own beliefs and perceptions limited, with the

EXAMPLE 02 RESULTS

With this classic technique, the text would look like:

“The myth of the cave is a metaphor for the human condition. Plato proposes that most people live like prisoners, trapped in their limited beliefs and perceptions, without access to the truth. The search for knowledge and freedom from ignorance requires effort and overcoming internal and external resistance.”

Resume deep learning2 (Google):

“Prisoners in the cave since birth, chained and limited to the perception of shadows on the wall (symbolizes ignorance and limitation of sensory knowledge). A freed prisoner explores the cave and the outside world, discovering actual reality (represents the search for knowledge and philosophy). The prisoner returns to the cave to share his knowledge but is ridiculed and misunderstood by the other prisoners (evidence resistance to change and attachment to preconceived beliefs). The myth serves as a metaphor for the human condition, trapped in our limited beliefs and perceptions, with the search for truth being an arduous and often lonely challenge”.

Summary by deep learning3 (ChatGPT4):

“Plato's myth of the cave describes prisoners chained from birth in a cave, where they see only shadows cast on the wall lit by a fire. When a prisoner is forced out of the cave and discovers the actual reality outside it, he returns to share his knowledge but is ridiculed by the other prisoners who only believe in the shadow reality. This myth metaphorizes the human condition of being trapped in limited perceptions and established beliefs, highlighting the search for truth as a lonely and often misunderstood challenge.”

CONCLUSIONS

- Integration of Machine Learning and Traditional Methods:
 - The text focuses on combining machine learning with traditional text analysis methods for effective text summarization.
 - Emphasizes the transformative potential of advanced visual techniques.
- Challenges and Future of Deep Learning:
 - Acknowledges challenges such as managing large datasets and complex models.

CONCLUSIONS

- Highlights the promising future of Deep Learning, with innovations like Google Gemini driving greater accuracy and performance.
- Foresees significant progress in handling complex text data.
- Applications expected in sectors such as education, healthcare, and media.
- Advocates for more research into hybrid models and real-time processing.
- Stresses the need for robust quantitative metrics to create precise, scalable, and adaptable solutions for modern information processing.

SOME FUTURE WORKS

- **Hybrid Models:** Combine different models to improve summarization quality.
- **Context-Aware Summarization:** Generate summaries based on the context of the content.
- **Multimodal Summarization:** Summarize content across various media types (text, images, video).
- **Cross-Language Summarization:** Summarize text in one language and translate into another.
- **Personalized Summarization:** Tailor summaries to individual user preferences.
- **Real-Time Summarization:** Create summaries in fast-changing, dynamic environments.
- **Explainable Models:** Make summarization models transparent and easy to understand.
- **Long-Document Summarization:** Improve summarization for lengthy documents.
- **Ethics and Bias:** Focus on reducing bias and promoting fairness in summarization.
- **Conversational Agents:** Integrate summarization into AI-powered conversational tools

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