



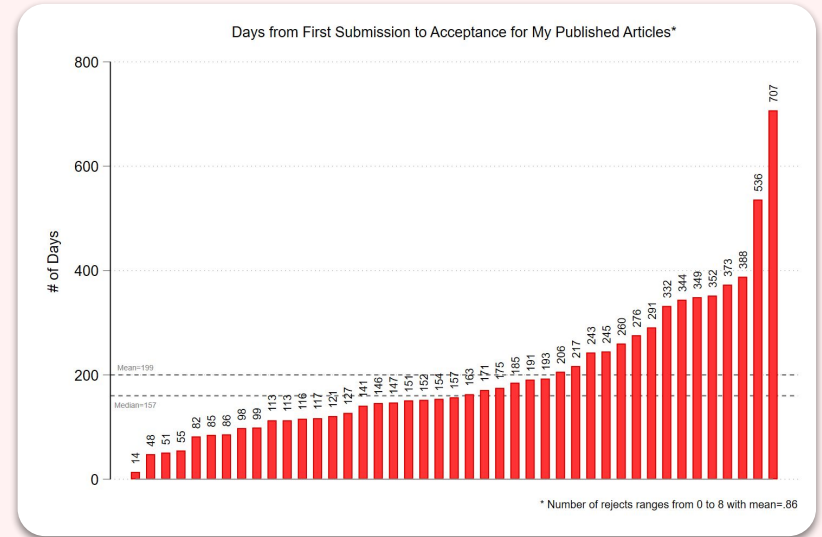
Eliza

AI-supported peer review

World Brain **Scholar**

Peer review has problems

- More papers, fewer qualified reviewers
- Reluctance of reviewer to accept
- Review time-consuming
- Long review times
- Inconsistent review quality
- Publishers hardly offer support for reviewers and editors



<https://inix.netlify.app/post/post16-peer-review-process/>

Eliza

- World's first and only professional tool concentrating on the evaluation of a scientific manuscript.
- Leverages state of the art AI-technology.
- Eliza supports both editors and reviewer.

Where in the publisher workflow?

- Eliza assumes that:
 - Paper has undergone main 'technical' checks (incl. plagiarism, subject, English language, image quality, captions, etc.) by the editorial office and is considered suitable for peer review.
 - The peer reviewers and editor have been identified.
 - Output of Eliza: peer-review reports, editorial decision incl. full decision letter.

Our goals

Eliza is an AI-powered tool to support the peer review process.

Better peer review, **faster** decisions.

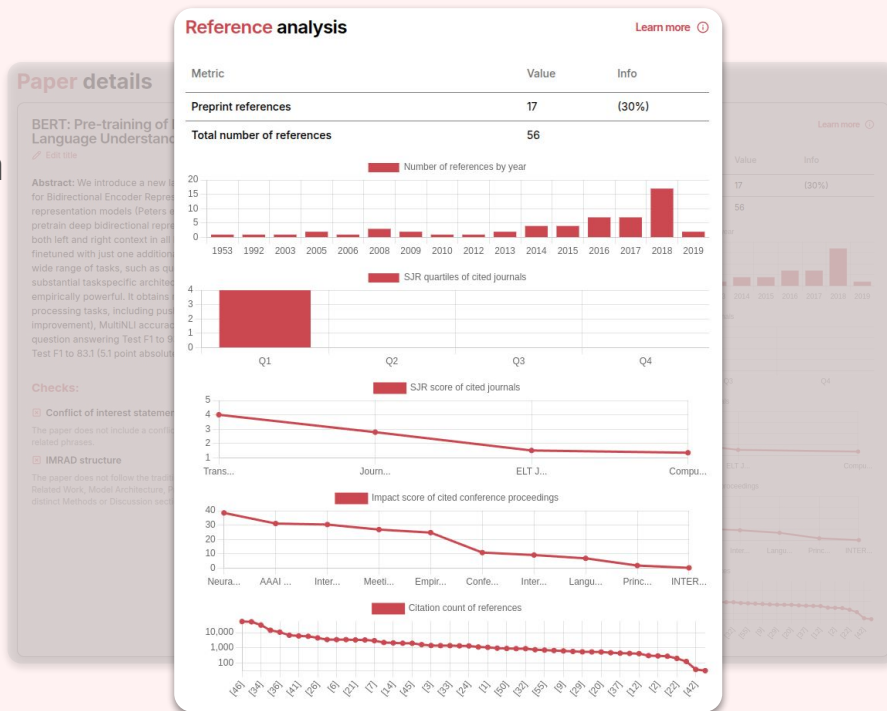
- Improve peer review quality
- Expand and engage the reviewer pool
- Give authors better feedback
- Accelerate and simplify decision making
- Safeguard research integrity

Eliza: three components

1. Manuscript analysis
2. Peer Reviewer Support
3. Editor Support

Manuscript analysis

- Basic content checks
- **Reference statistics and additional data**
- Related work suggestions
- Reference similarity checks



Manuscript analysis

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Paper details

BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding
[Full text](#)

Abstract: We introduce a new language representation model called BERT, which stands for Bidirectional Encoder Representations from Transformers. Unlike recent language representation models (Peters et al., 2018a; Radford et al., 2018), BERT is designed to pre-train deep bidirectional representations from unlabeled text by jointly conditioning on

Reference analysis [Learn more](#)

Metric	Value	Info
Preprint references	17	(30%)
Total number of references	56	

Related work suggestions

Results are sorted by relevance to the paper under review.

[1] What do you learn from context? Probing for sentence structure in contextualized word representations

Ian Tenney, Patrick Xia, Berlin Chen, Alex Wang, Adam Poliak, R Thomas McCoy, Najoung Kim, Benjamin Van Durme, Samuel R. Bowman, Dipanjan Das, Ellie Pavlick (2019)

[2] A Survey on Vision Transformer

Kai Han, Yunhe Wang, Hanjing Chen, Xinghao Chen, Jianyuan Guo, Zhenhua Liu, Yehui Tang, An Xiao, Chunjing Xu, Yixing Xu, Zhaohui Yang, Yiman Zhang, Dacheng Tao (2022)

[3] BioBERT: a pre-trained biomedical language representation model for biomedical text mining

Jinhyuk Lee, Wonjin Yoon, Sungdong Kim, Donghyeon Kim, Sunkyu Kim, Chan Ho So, Jaewoo Kang (2019)

[4] ELECTRA: Pre-training Text Encoders as Discriminators Rather Than Generators

Kevin Clark, Minh-Thang Luong, Quoc V. Le, Christopher D. Manning (2020)

[5] Highly accurate protein structure prediction with AlphaFold

John Jumper, Richard Evans, Alexander Pritzel, Tim Green, Michael Figurnov, Olaf Ronneberger, Kathryn Tunyasuvunakool, Russ Bates, Augustin Židek, Anna Potapenko, Alex Bridgland, Clemens Meyer, Simon Kohl, Andrew J. Ballard, Andrew Cowie, Bernardino Romera-Paredes, Stanislav Nikolov, Rishub Jain, Jonas Adler, Trevor Back, Stig Petersen, David Reiman, Elen Clancy, Michal Zelienski, Martin Steinegger, Michalina Pacholska, Tamas Berghammer, Sebastian W. Bodenstein, David Silver, Oriol Vinyals, Andrew Senior, Koray Kavukcuoglu, Pushmeet Kohli, Demis Hassabis (2021)

Total items: 19



Manuscript analysis

- Basic content checks
- Reference statistics and additional data
- Related work suggestions
- **Reference similarity checks**



Peer reviewer support

- Reviewer in charge
- Structured reviewing form
- Language support through rephrase functionality
- Paper-aware chat assistant
- Automatic improvement suggestions

The screenshot displays the 'Peer review' interface for a paper titled 'BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding'. The interface is divided into two main sections: a structured reviewing form and a chat assistant.

Peer review
Reviewing paper: BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding

Buttons: View paper details, View PDF

Progress: 1 Write your review, 2 Review suggested changes, 3 Final checks & submission

Instructions:
Fill out the textfields with your findings on the paper. Provide a short summary of the paper, as well as strong/weak points and any other comments.
The **rephrase** option will automatically rephrase the text you have written - feel free to use it to improve your text. **Our system can make mistakes. Make sure to check rephrased text.**

Buttons: Rephrase, Undo, Clear

Summary of the paper

The paper "BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding" introduces a revolutionary approach to natural language processing (NLP) by leveraging masked language modeling (MLM) and next sentence prediction (NSP) for pre-training a deep bidirectional transformer. This work has fundamentally transformed the field of NLP, setting new state-of-the-art performance across a wide array of benchmarks and inspiring an entire wave of research into transformer-based architectures.

Buttons: Rephrase, Undo, Clear

Strong points of the paper

Provide a concise description of the paper topic and findings.

Groundbreaking Pre-training Objective: The introduction of MLM and NSP has redefined pre-training strategies in NLP, moving beyond traditional left-to-right or autoregressive models. This innovation is the cornerstone of BERT's success and a major advancement for the field.

Impressive Empirical Results: BERT demonstrates unprecedented improvements across multiple benchmarks, including CLUE, SQuAD, and others. The consistent outperformance of prior approaches is compelling evidence of its effectiveness.

Bidirectionality in Contextual Representations: By pre-training a truly bidirectional model, BERT captures context from both directions, resulting in richer and more meaningful representations compared to unidirectional models.

Transfer Learning Breakthrough: BERT establishes the paradigm of pre-training followed by fine-tuning, which has become the de facto standard in NLP. Its adaptability to a wide range of downstream tasks highlights its versatility.

Buttons: Rephrase, Undo, Clear

Weak points of the paper

Compute Requirements: While BERT's performance is exceptional, its pre-training requires significant computational resources, which may limit accessibility for some researchers. However, this is a reflection of the state of hardware and software during the time of its publication rather than a flaw in the model itself.

Next Sentence Prediction (NSP): Although NSP is presented as a key innovation, subsequent studies have shown it to be less effective or redundant. This could be an area for refinement rather than a major critique.

Buttons: Rephrase, Undo, Clear

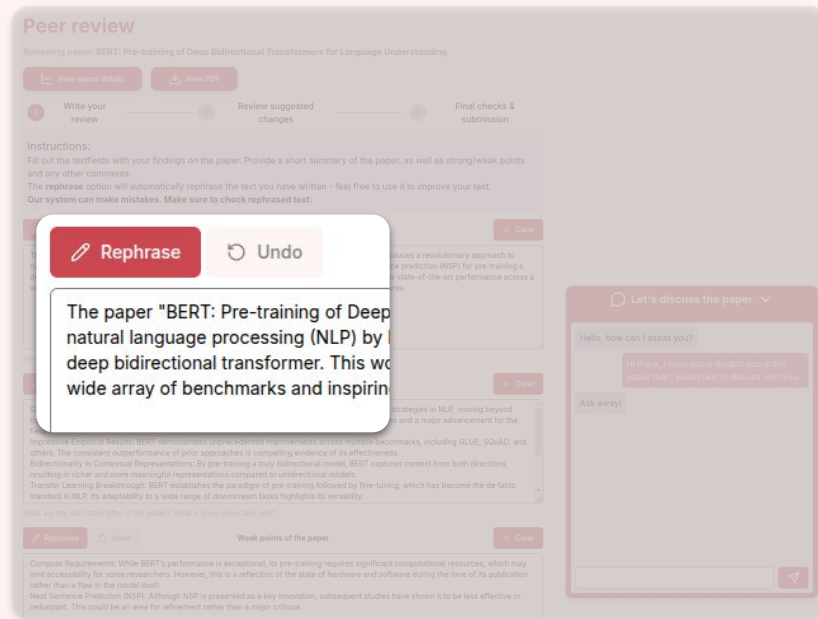
Chat Assistant: Let's discuss the paper

Buttons: Hello, how can I assist you?, Ask away!

Message: Hi there, I have some doubts about this paper that I would like to discuss with you.

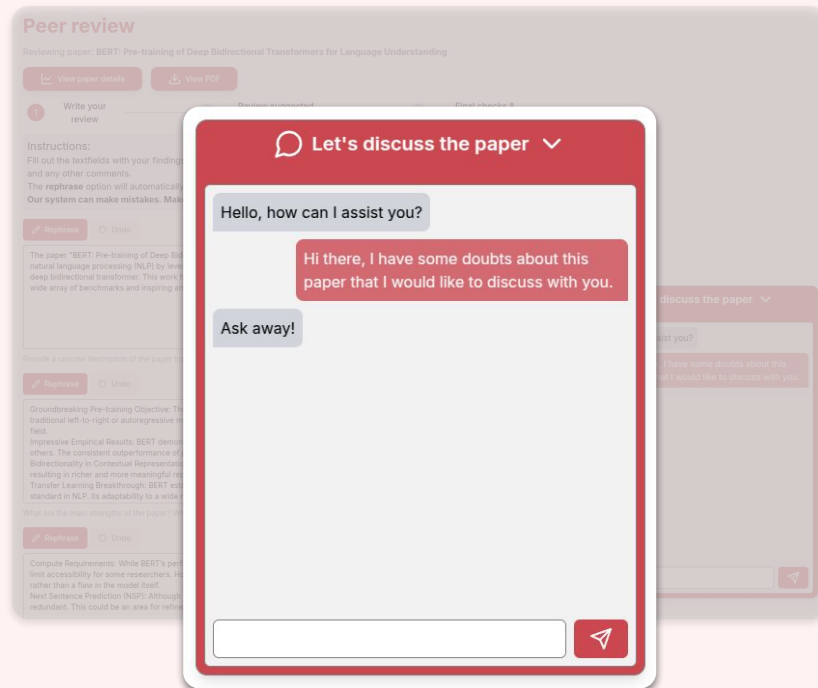
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Peer reviewer support

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The screenshot displays a peer review interface. At the top, it says "Peer review" and "Reviewing paper: BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding". Below this are two buttons: "View original paper" and "View PDF". The main content area is titled "Suggestions for improvement < 1/3 >". It contains the text: "The reviewer should provide a specific critique rather than an outright rejection without reasoning." Below this is a section for "Proposed revision:" which reads: "The paper could benefit from a clearer explanation of how the bidirectionality in BERT's architecture directly contributes to performance gains over unidirectional models. More detailed comparative analysis with prior models like ELMo or GPT would strengthen the claims." A "Copy revision" button is located below the proposed revision. At the bottom of the interface, there are three buttons: "Rephrase" (with a pencil icon), "Undo" (with a circular arrow icon), and "Weak points of the paper" (with a flag icon). To the right of these buttons is a "Clear" button (with an 'x' icon). Below the buttons is a text input field containing the text: "I think this paper is bad and should be rejected outright...". At the very bottom, there is a small note: "Feedback: This could be an area for refinement rather than a major critique."

3. Editor support

- Executive summary
 - Supported by references to reviews
- Personalized and informative decision letters
- Search the paper to verify reviewer comments

Editor review

Paper title: BERT: Pre-training of Deep Bidirectional Transformers for Language Un...

Select a decision

Select a decision

Select your final decision for the paper.

Select a template

Select a template

Select a template for the decision you picked to pre-fill the decision letter, or write your own letter below.

Decision letter

Write your decision letter here

Write your decision letter here. Start from scratch or use a template. You can use Markdown syntax.

Submit Save as draft

Executive summary

The review recommends a weak rejection, although it contains a comprehensive list of strengths highlighting the originality and transformative impact of the work. The strengths emphasize BERT's innovative pre-training objectives, impressive empirical results, and its significant influence on the field of NLP. The weaknesses section and specific comments for the authors are incomplete or missing.

Copy content

Strengths

The main strengths of the paper "BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding" include its groundbreaking pre-training objectives, namely masked language modeling and next sentence prediction, which have redefined strategies in NLP [1]. Additionally, the paper demonstrates impressive empirical results with unprecedented improvements across multiple benchmarks, highlighting the effectiveness of BERT [1]. Furthermore, the bidirectionality in contextual representations and the paradigm of pre-training followed by fine-tuning establish BERT as a versatile and adaptable model for a wide range of downstream tasks [1].

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Weaknesses

Comments

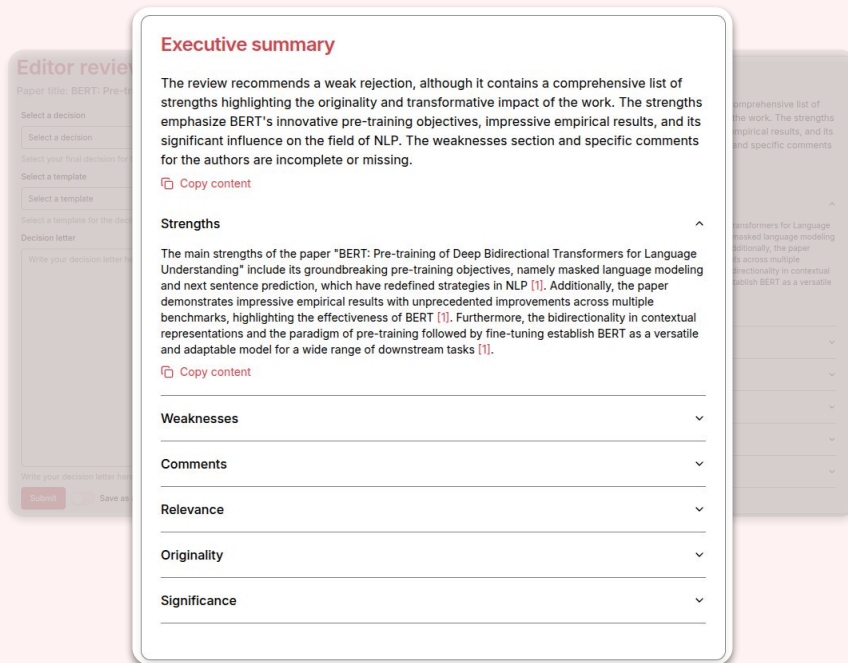
Relevance

Originality

Significance

Editor support

- Executive summary
 - Supported by references to reviews
- Personalized and informative decision letters
- Search the paper to verify reviewer comments



Editor review

Paper title: BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding

Select a decision

Select your final decision for this paper

Select a template

Select a template for the decision letter

Decision letter

Write your decision letter here

Submit Save as draft

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[Copy content](#)

Weaknesses

Comments

Relevance

Originality

Significance

Editor support

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 - Supported by references to reviews
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- **Search the paper to verify reviewer comments**

The screenshot displays the 'Editor review' interface. On the left, there are fields for 'Paper title: BERT: Pre-training of Deep Bidirectional Transformers for Language Un...', 'Select a decision', 'Select your final decision for the paper', and 'Select a template'. On the right, the 'Executive summary' section contains a review recommendation and a 'Copy content' button. A search box is overlaid on the interface with the text 'Query the paper for statements made by the reviewer:' and a search input field containing 'next sentence prediction'. Below the search input, a list of search results is shown, each with a section reference and a snippet of text.

Section	Statement
Sec. 3.1 - Pre-train...	Task #2: Next Sentence Prediction (NSP) Many important downstream tasks such as Question...
Sec. 4.4 - SWAG	When fine-tuning on the SWAG dataset, we construct four input sequences, each containing the...
Sec. 6 - Conclusion	Compared to standard language model training, the masked LM only make predictions on 15% of...
Sec. 4.2 - SQuAD v1.1	Wikipedia containing the answer, the task is to predict the answer text span in the passage.
Sec. 2.2 - ...	More recently, sentence or document encoders which produce contextual token representations ha...
Sec. 4.4 - SWAG	The Situations With Adversarial Generations (SWAG) dataset contains 113k sentence-pair completio...
Sec. 3 - BERT	We use WordPiece embeddings (Wu et al., 2016) with a 30,000 token vocabulary. The first token of...

Eliza: Main features

- **Interactive:** guidance through process
- **Engages peer reviewer:** Eliza requires reviewer input before giving any feedback.
- **Structured reviewing:** peer reviewer is prompted to write a structured PR dealing with specific aspects of the paper.
- **User-driven and controlled:** Eliza provides suggestions to further substantiate and complete the reviewer's and editor's reports.
- **Efficient decision-making** for editor through executive summaries of reviewer's comments on major aspects of paper.
- **Lowers barriers** for peer-reviewers and increases quality of reports and language from novice and non-native English-speaking reviewers.

Eliza: Technology, Privacy and IP

Technology

- Leverages various AI-technologies: LLMs, RAG, semantic profiling,
- Datasets: trained on multiple datasets with thousands of papers and their peer-reviews.
- Works as stand-alone or integrated into publisher's workbench via our APIs.
- Eliza not off-the-shelf product: can be customized according to publisher's peer-review policy.

Privacy and IP

- Paper copyright and reviewer/editor privacy are protected. Papers will only be used within Eliza-environment.
- All paper and user-data protected according to GDPR & EU AI-regulations.

Eliza: Current status

- Ongoing pilots and tests with publishers
 - Ongoing feedback from researchers and societies
 - Looking for new collaborations
-
- Free version: available for authors and reviewers through our website!



Eliza: Outlook

- New features under development
 - Checking article subject with journal's scope
 - If out of scope: journal suggestion (within or outside publisher's portfolio)
 - Manuscript revision analysis
 - References use: are they indeed used in the paper
 - Citation checking:
 - does citation indeed occur in cited paper
 - is citation in line with author claim
- Collecting review and reviewer data for editorial office/publisher
- Free version: available for authors and reviewers through our website

Thank you!

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