

AI-Powered Research: Tools for a Modern Researcher

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Typical research process

- Formulation of a precise question
- Develop a detailed understanding of the field
- Gathering of evidence that relates to the question
- Linking of the question and evidence with an argument
- Publication of results

Semantic Scholar

- AI-powered search engine
- A better version of Google Scholar



SEMANTIC SCHOLAR

A free, AI-powered research tool for scientific literature

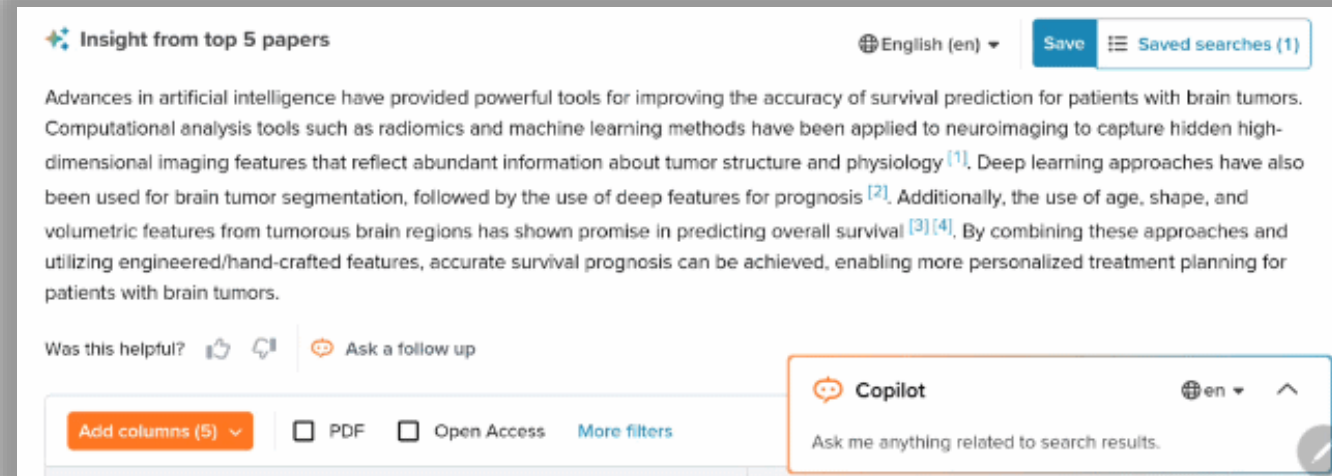
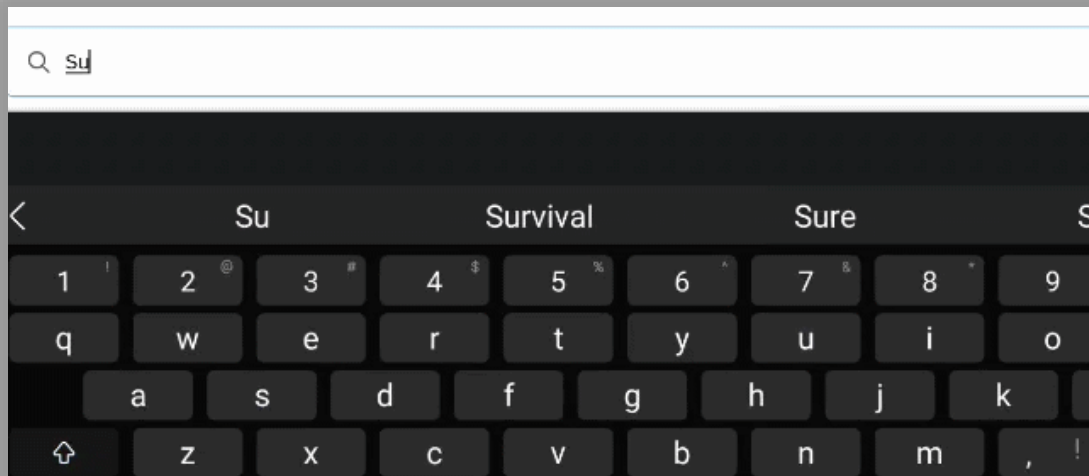
Search 214,311,338 papers from all fields of science

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Literature review with Scispace

- Provides an easy way to find, understand, and learn any research paper



Reading with Scispace

Use copilot to:

- Ask questions
- Make follow-up questions
- Explain a selected text, table, equations etc.

The screenshot displays the Scispace interface. On the left, a document viewer shows the abstract of a paper titled "DeepLabv3" by Liang-Chieh Chen, George Papandreou, Florian Schroff, and Hartwig Adam. The abstract text is partially highlighted in blue. On the right, a Copilot chat window is open, displaying a response to a query about the paper's performance. The chat window includes a feedback button, a timestamp of 5:05 AM, and a "Save as note" button. Below the chat window, there is a search bar with the text "Explain Abstract of this paper in 2 lines" and a "+12 more" link.

1 / 14 Explain math & table 96%

Liang-Chieh Chen George Papandreou Florian Schroff Hartwig Adam
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Abstract

In this work, we present atrous convolution, a powerful tool to explicitly adjust Alex's field-of-view as well as control the resolution of feature responses computed by Deep Convolutional Neural Networks, in the application of semantic image segmentation. To handle the problem of segmenting objects at multiple scales, we design modules which employ atrous convolution in cascade or in parallel to capture multi-scale context by adopting multiple atrous rates. Furthermore, we propose to augment our previously proposed Atrous Spatial Pyramid Pooling module, which probes convolutional features at multiple scales, with image-level features encoding global context and further boost performance. We also elaborate an implementation details and share our experience on training our system. The proposed 'DeepLabv3' system significantly improves over our previous DeepLab versions without DenseCRF post-processing and attains comparable performance with other state-of-art models on the PASCAL3D+ 2012 semantic image segmentation benchmark.

1. Introduction

Figure 1. Atrous convolution with kernel size 3×3 and different rates. Standard convolution corresponds to atrous convolution with rate = 1. Employing large value of atrous rate enlarges the model's field-of-view, enabling object encoding at multiple scales.

responses are computed within DCNNs without requiring learning extra parameters.

Another difficulty comes from the existence of objects at multiple scales. Several methods have been proposed to handle the problem and we mainly consider four categories in this work, as illustrated in Fig. 2. First, the DCNN is applied to an image pyramid to extract features for each scale input [22, 19, 40, 35, 12, 11] where objects at different scales become prominent at different feature maps. Sec-

Copilot Notes English (en)

as deep convolutional neural networks, atrous convolution, and spatial pyramid pooling.

- The proposed DeepLabv3 system achieves competitive performance without the need for post-processing techniques such as DenseCRF.

Write a feedback 5:05 AM

Save as note Follow up

Explain Abstract of this paper in 2 lines +12 more

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- Builds a network of papers from citations.
- Uses network analysis algorithm to provide helpful information
- Provides a way to link papers in different domains.

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255	12	2018	<u>Yes</u>	31,713	280,152	2
Cited By	Citing	Published	Open Access	Papers in Graph	Citations in Graph	Graph Depth

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Paper Filters ⓘ

Keywords

Min Distance **Max Distance** **Min Year** **Max Year**

Add Papers to the Graph

Paper Title or DOI

or [Import BibTeX file](#)

Zero draft with Bing, ChatGPT, Bard

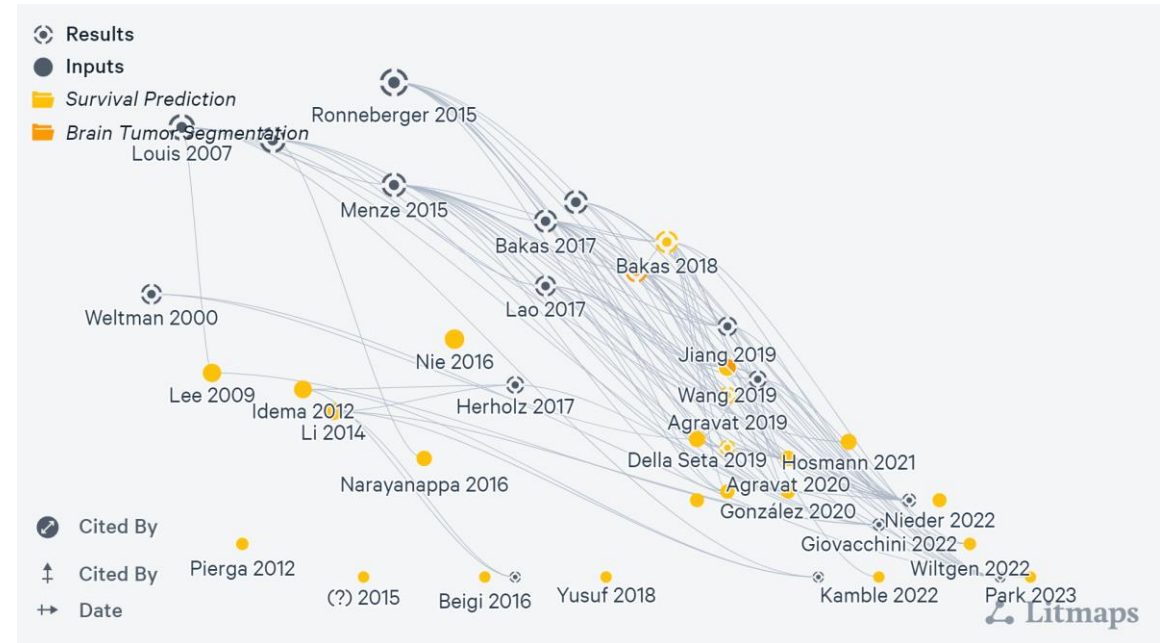
- Writing a zero draft is also called “free writing,” an idea popularised by Peter Elbow in his 1973 book *Writing Without Teachers*.
- Set your timer to 25min and start writing as many words as possible.
- Ask ChatGPT to edit your zero draft to make it more coherent and cohesive



Litmaps

A robust literature map software that can help researchers

- discover new academic papers,
- track the development of a field of research,
- and identify gaps in the literature.



The use of computers is now ubiquitous. They have transformed every aspect of human life. They can be found in cars; they are being used to communicate, automate tasks and create innovative solutions to the problem the world is facing every day. They are now woven into the fabric of human life. Since the COVID-19 pandemic, a paradigm has shifted in how people interact, learn, and do business. Recent revelations have seen the need to embrace digital technologies to bring agility, operational efficiency, and innovation across organizations. As more organizations and individuals begin to adopt digital technologies, there has been a growing need to fill the expertise gap to design, develop, and maintain exciting technologies.

• and · Add a comma

• GRAMMAR

~~problem~~ → **problems**

It seems that **problem** may not agree in number with other words in this phrase.

? Learn more



• are now woven · Rewrite the sentence

• begin to · Remove the phrase

94 Overall score >

Goals >

All suggestions

Correctness

Clarity

Engagement

Delivery

Grammarly

- A writing assistant tool that helps people improve their writing.
- It can help with a variety of writing tasks, including:
 - Checking for grammar, spelling, and punctuation errors
 - Identifying and correcting stylistic issues, such as overused words and phrases, wordiness, and passive voice
 - Improving the clarity and conciseness of your writing
 - Ensuring that your writing is appropriate for the intended audience

Paperpal

Rephrase and 3 other suggestions

In the production sector, ~~it is shown that~~ seafood comes from three main sources: ~~which is the~~ wild catch, aquaculture (freshwater ~~culture~~ and marine culture), and ~~seafood imported~~ ~~imported ones~~ from other countries.



Accept All

Reject All

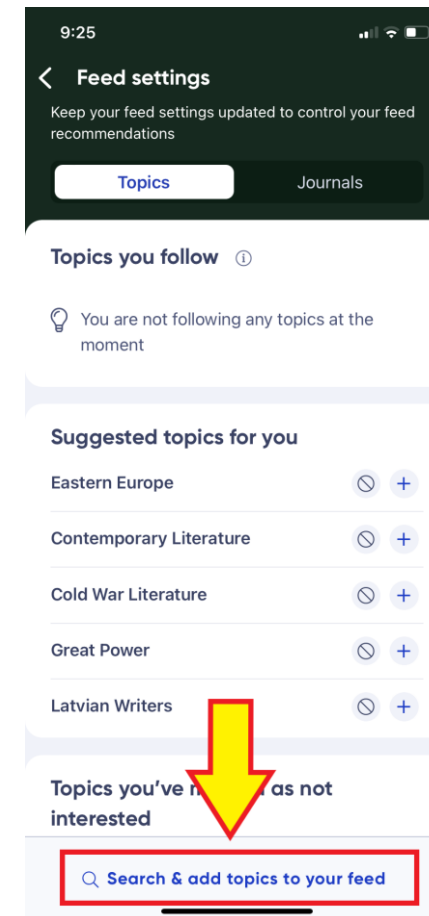
Insertion

Another AI writing assistant for researchers:

- Provides real-time suggestions and checks, including language, grammar, vocabulary and consistency.
- Can evaluate the whole manuscript for common errors and omissions.

Staying Up to Date with R Discovery

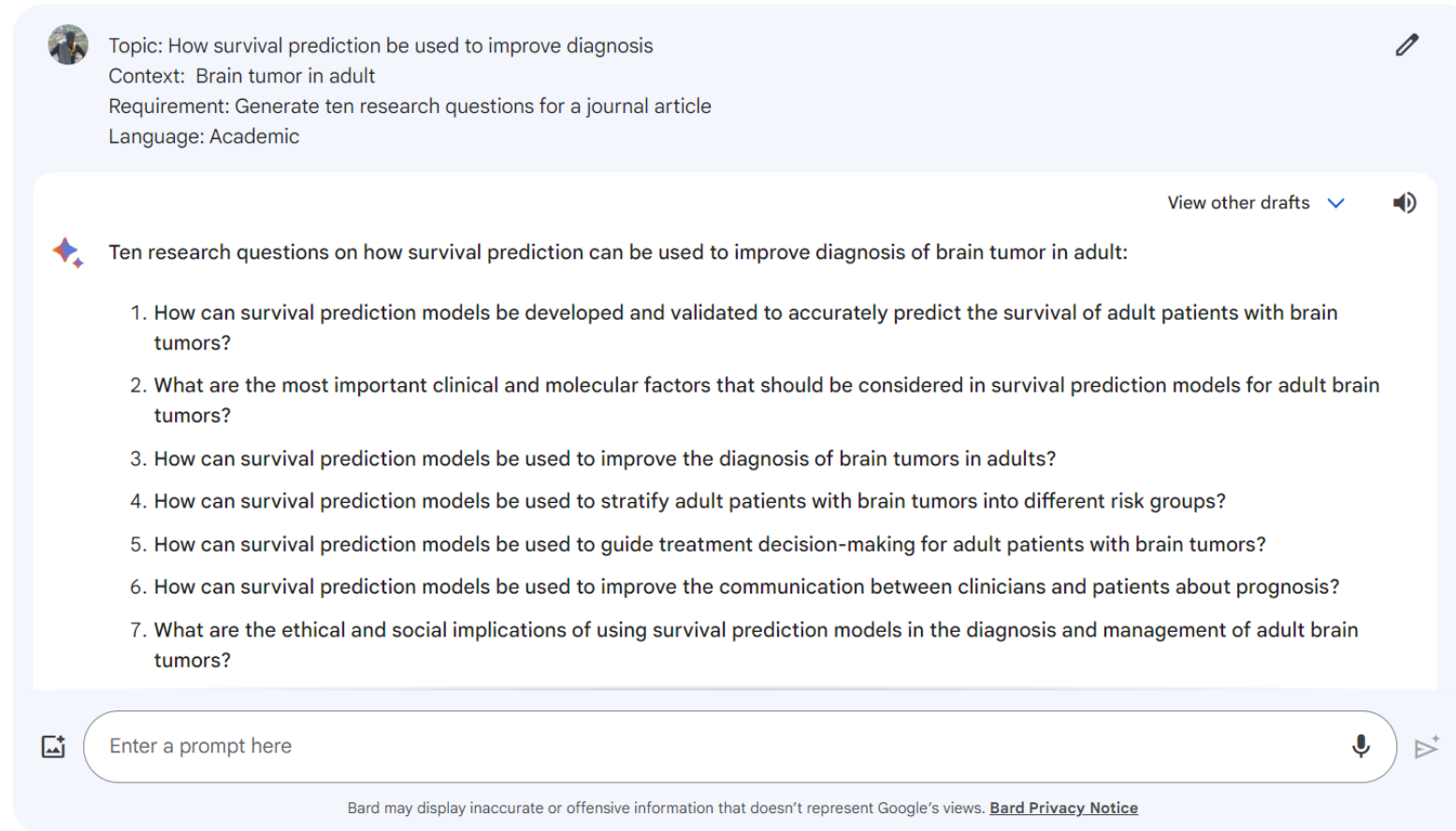
A smartphone app that keeps you updated with recent published literature in your field of research



AI prompts for Academic Writing

AI prompts like ChatGPT, Bing AI, and Google Bard can be used to:

- Brainstorm research questions
- Produce an outline for a research/seminar paper
- Critique Partner
- Reading assistant
- Write introductions and conclusions.



The screenshot shows the Google Bard interface. At the top, the topic is "How survival prediction be used to improve diagnosis" with a context of "Brain tumor in adult". The requirement is to "Generate ten research questions for a journal article" in "Academic" language. The main prompt is "Ten research questions on how survival prediction can be used to improve diagnosis of brain tumor in adult:". Below this, seven research questions are listed. At the bottom, there is a text input field with the placeholder "Enter a prompt here" and a microphone icon. A footer note states: "Bard may display inaccurate or offensive information that doesn't represent Google's views. [Bard Privacy Notice](#)".

Topic: How survival prediction be used to improve diagnosis
Context: Brain tumor in adult
Requirement: Generate ten research questions for a journal article
Language: Academic

View other drafts

Ten research questions on how survival prediction can be used to improve diagnosis of brain tumor in adult:

1. How can survival prediction models be developed and validated to accurately predict the survival of adult patients with brain tumors?
2. What are the most important clinical and molecular factors that should be considered in survival prediction models for adult brain tumors?
3. How can survival prediction models be used to improve the diagnosis of brain tumors in adults?
4. How can survival prediction models be used to stratify adult patients with brain tumors into different risk groups?
5. How can survival prediction models be used to guide treatment decision-making for adult patients with brain tumors?
6. How can survival prediction models be used to improve the communication between clinicians and patients about prognosis?
7. What are the ethical and social implications of using survival prediction models in the diagnosis and management of adult brain tumors?

Enter a prompt here

Bard may display inaccurate or offensive information that doesn't represent Google's views. [Bard Privacy Notice](#)

The right mindset for AI-Powered tools

- Researchers should use AI to
 - automate tasks,
 - find summaries information,
 - and generate outlines,
- but they should constantly critically evaluate the output of AI tools
- use their judgment to make decisions.

Links

- <https://bard.google.com/>
- <https://consensus.app/>
- <https://typeset.io/>
- <https://paperpal.com/>
- <https://www.perplexity.ai/>
- <https://www.grammarly.com/>
- <https://inciteful.xyz/>
- <https://researchrabbitapp.com/>
- [Bing AI – Search](#)
- <https://discovery.researcher.life/>
- <https://www.semanticscholar.org/>
- <https://www.connectedpapers.com/>
- <https://www.litmaps.com/>

Thank You