

C-SEO Bench: Does Conversational SEO Work?

Haritz Puerto, Martin Gubri, Tommaso Green, Seong Joon Oh, Sangdoo Yun

()^{NT} Parameter Lab  **NAVER** AI LAB



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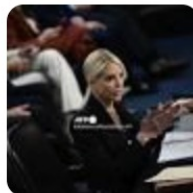
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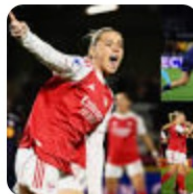
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Here are the latest major news headlines from around the world:

Top World News

- Nobel Prize in Medicine for 2025 was awarded to Mary E. Bronco, Fred Ramdale, and Shimon Sakaguchi for their groundbreaking discoveries in peripheral immune tolerance, advancing research in autoimmune diseases.  youtube
- Ukraine launched one of its largest drone attacks on Russian territory since the start of the war, targeting facilities behind Russia's front lines, including an ammunition plant and oil terminal.  youtube
- Peace talks on Gaza continue in Egypt with Qatari and U.S. officials participating, as confirmed by President Trump.  indianexpress

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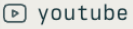



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Is SEO Dead? How to Update your Seo Strategy to 2025

Generative Engine Optimization (GEO): The Future Of Search Is Here



By [Adam Binder](#), Forbes Councils Member.

for [Forbes Agency Council](#), [COUNCIL POST](#) | Membership (fee-based)

Published Jan 02, 2025, 07:30am EST



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SEO Is Changing: GEO Is Here - How Does AI Talk About You?

Win the **generative** internet with the most robust platform for AI **search** by Profound.
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ChatGPT.

Why SEO as we know it is dead (and what's next).

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I Keep On Hearing That SEO Is Dead In The AI Era

As AI keeps improving and search engines continue to change how they serve up results, I keep hearing that traditional SEO techniques are becoming obsolete. It seems that Google now comes up with its own answers to search questions using a variety of sources to put the answer together. What sort of tactics are people using here to try and keep up with what feels like a pretty thm change?

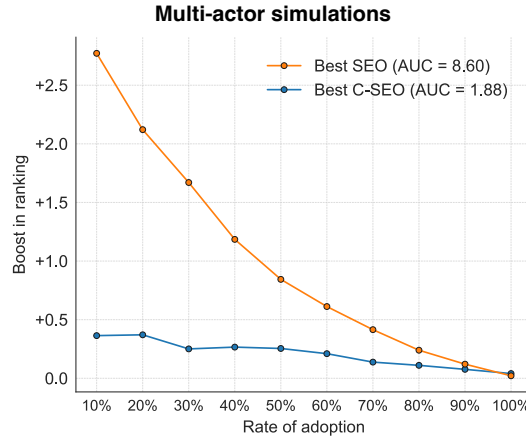
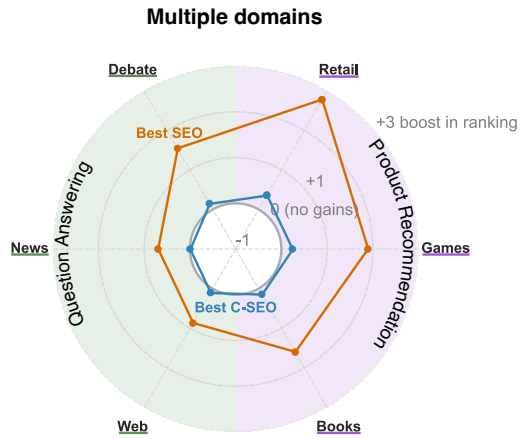
How Generative Engine Optimization (GEO) Rewrites the Rules of Search

Zach Cohen and Seema Amble

6

“SEO is outdated!
Long live to C-SEO!”

Is this true?



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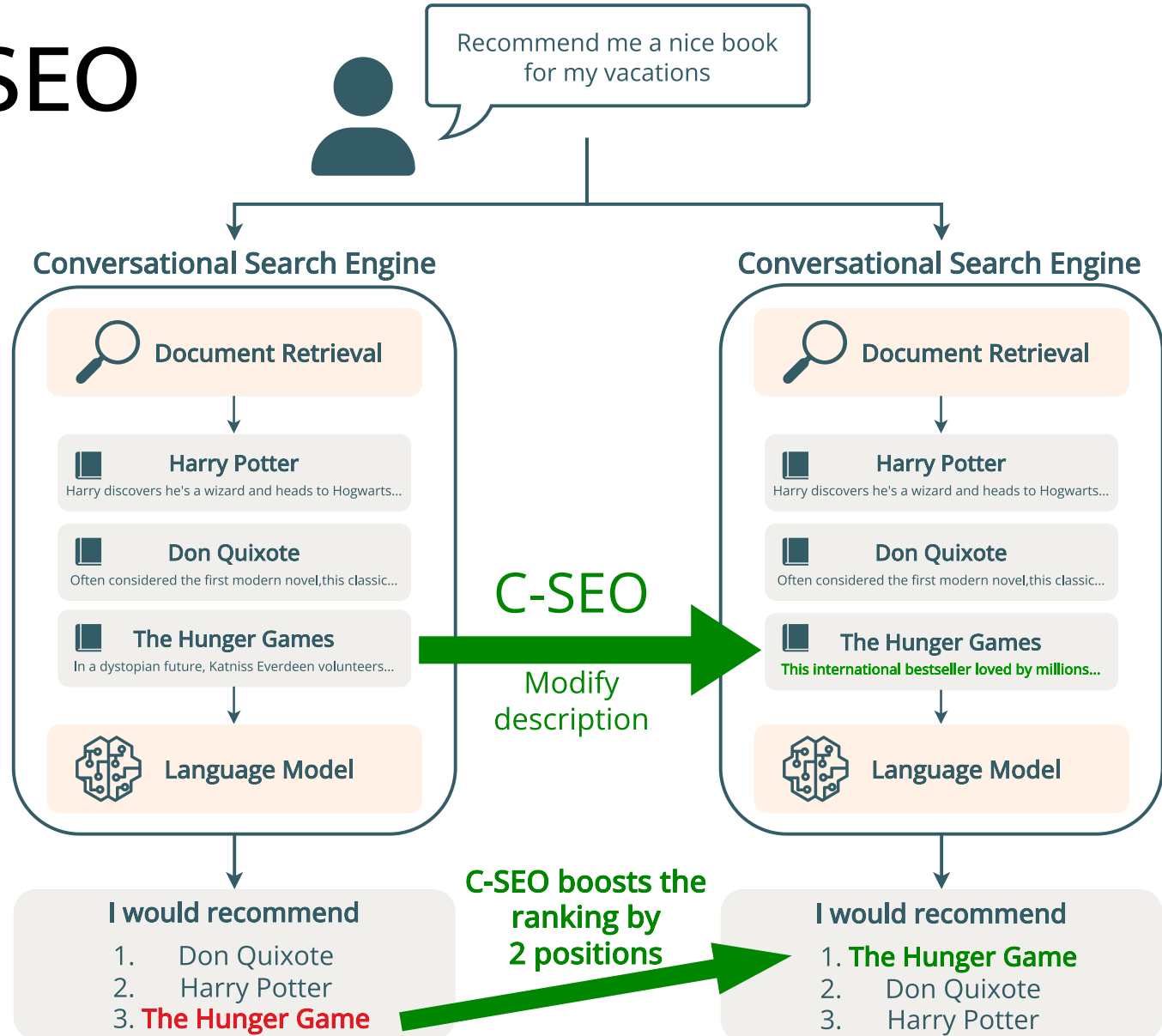


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Conversational SEO



Why Current Benchmarks are not Enough?

Table 1: **Benchmarks comparison.**  denotes black-hat C-SEO;  denotes white-hat C-SEO.

Benchmarks	Methods	Tasks	Domains	Real Data	#Docs	#Adopters
Aggarwal et al. 2024		1	1	✓	5k	1
Pfrommer et al. 2024		1	1	✗	1.1k	1
Kumar and Lakkaraju 2024		1	1	✗	10	1
Nestaas et al. 2025		1	1	✓	50	Many
C-SEO Bench (Ours)		2	6	✓	16.3k	Many

- Focus on adversarial setting! → Different from normal SEO industry!
- Text modifications depends on domains!
- AI Search applies to multiple tasks
- Need to analyze gains across number of adopters to be realistic

C-SEO Benchmark

Task	Domain	#Queries	#Docs
Product Recommendation	Retail	500	5000
	Video Games	436	4360
	Books	249	2245
Question Answering	Web	300	1500
	News	294	2375
	Debate	142	880

2 tasks, 6 domains, real-world data, 1.9k queries, 16k documents

C-SEO Methods

- **C-SEO Methods (Aggarwal et al., KDD 2024)**

- Authoritative
- Statistics
- Citations
- Fluency
- Unique Words
- Technical Terms
- Simple Language
- Quotes

- **New Methods**

- Content Improvements
 - Improve document combining all prior methods
- LLM Guidance
 - markdown summary concatenated at the beginning of the document to guide the LLM about its content. Inspired by LLMs.txt

Setup

- **Models for conversational search engine:**

- GPT 4o-mini
- Claude 3.5 Haiku
- O3
- O4-mini

- **Model for C-SEO implementation:**

- GPT-4o mini

- **Evaluation**

- Rank improvement
- Rank before – rank after

- **Wilcoxon signed-rank test**

- Is rank smaller than the original one?

- **P-values corrected with Holm-Bonferroni**

Current C-SEO Methods do not Work!

Method	Product Recommendation			Question Answering		
	Retail	Games	Books	Web	News	Debate
Authoritative	0.11 \pm 1.18	0.07 \pm 1.25	0.11 \pm 0.94	-0.04 \pm 0.89	-0.04 \pm 1.03	0.01 \pm 1.55
Statistics	-0.07 \pm 1.00	0.00 \pm 1.11	-0.11 \pm 1.04	-0.53 \pm 1.27	-0.05 \pm 1.31	-0.80 \pm 1.70
Citations	-0.01 \pm 1.14	0.04 \pm 1.23	0.00 \pm 0.91	0.03 \pm 1.00	-0.10 \pm 1.09	-0.15 \pm 1.50
Fluency	0.06 \pm 1.11	0.07 \pm 1.27	0.07 \pm 1.05	0.03 \pm 0.89	-0.01 \pm 1.08	0.32 \pm 1.64
Unique Words	0.09 \pm 1.09	0.02 \pm 1.20	0.04 \pm 1.04	-0.07 \pm 0.92	-0.10 \pm 1.03	-0.08 \pm 1.66
Tech. Terms	0.05 \pm 1.13	0.07 \pm 1.32	-0.03 \pm 0.86	0.01 \pm 0.95	-0.03 \pm 0.97	-0.05 \pm 1.56
Simple Lang.	0.03 \pm 1.05	0.11 \pm 1.39	0.01 \pm 0.78	0.02 \pm 1.02	-0.04 \pm 1.00	0.04 \pm 1.63
Quotes	0.06 \pm 1.09	0.04 \pm 1.29	0.01 \pm 0.97	0.00 \pm 0.96	-0.06 \pm 1.07	-0.19 \pm 1.64
LLM Guid.	0.36 \pm 1.47	0.24 \pm 1.05	0.14 \pm 1.07	0.10 \pm 0.99	0.00 \pm 1.10	0.15 \pm 1.65
Content Impr.	0.18 \pm 1.09	0.13 \pm 1.23	0.11 \pm 0.95	0.02 \pm 0.90	-0.04 \pm 1.00	0.11 \pm 1.61
Best SEO	2.77 \pm 2.31	1.89 \pm 2.32	1.60 \pm 2.04	0.87 \pm 1.35	0.70 \pm 1.64	1.54 \pm 2.07

Results for
GPT4o-mini

Similar results for:

- Claude 3.5 Haiku
- o3
- o4-mini

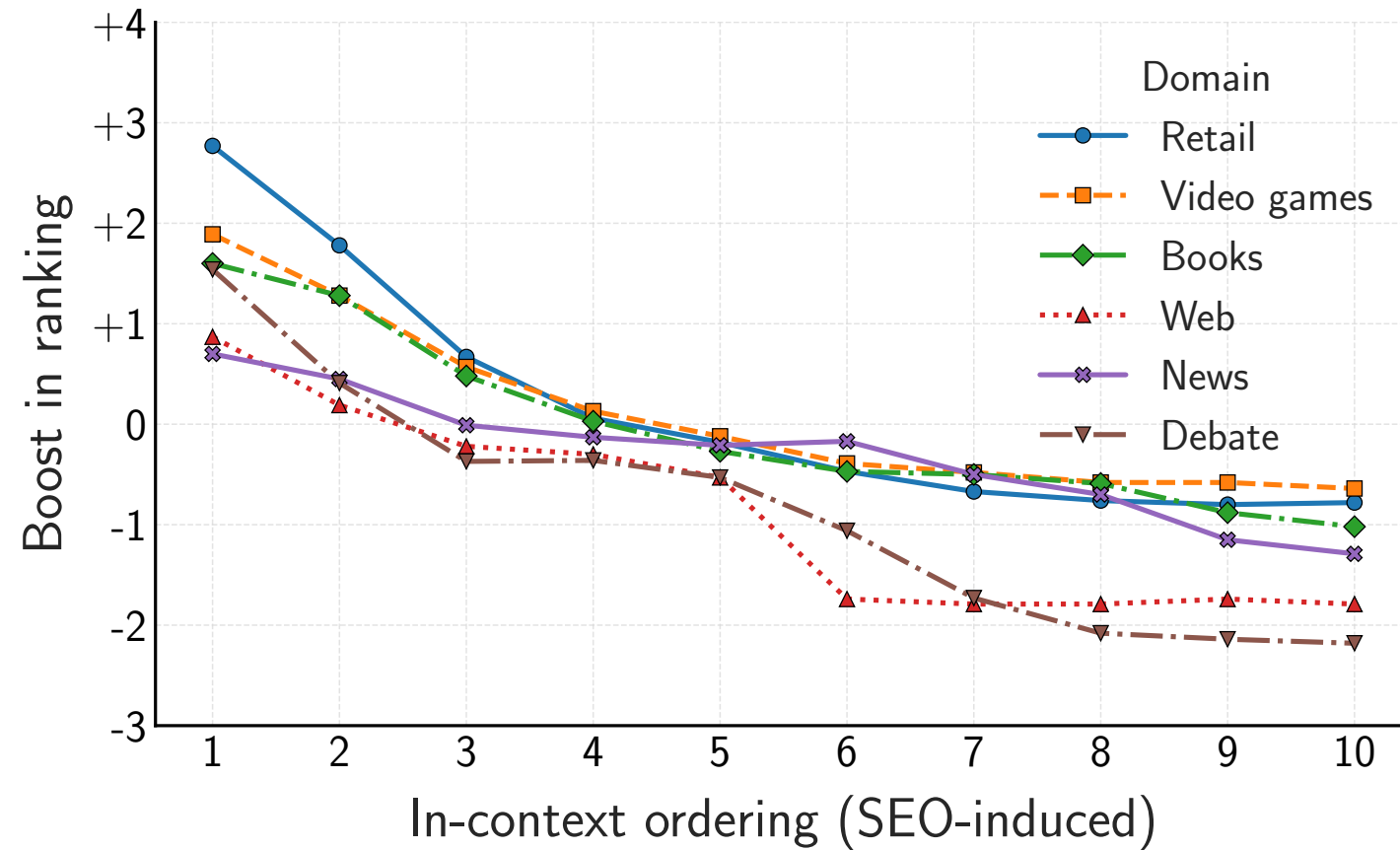
SEO is Much More Effective!

C-SEO can be Negative!

Method	Product Recommendation			Question Answering		
	Retail	Games	Books	Web	News	Debate
Authoritative	-0.53 ± 1.29	-0.20 ± 1.05	-0.34 ± 1.06	0.03 ± 0.72	0.04 ± 0.77	0.01 ± 1.41
Statistics	-0.82 ± 1.47	-0.10 ± 1.01	-0.60 ± 1.34	-0.58 ± 1.18	-0.12 ± 0.91	-0.85 ± 1.66
Citations	-0.49 ± 1.31	-0.16 ± 0.96	-0.31 ± 1.10	-0.06 ± 0.78	-0.09 ± 0.87	0.06 ± 1.31
Fluency	-0.48 ± 1.30	-0.08 ± 1.08	-0.37 ± 1.18	0.00 ± 0.73	0.05 ± 0.87	0.18 ± 1.40
UniqueWords	-0.52 ± 1.26	-0.22 ± 0.91	-0.43 ± 1.11	-0.01 ± 0.83	-0.05 ± 0.87	0.04 ± 1.40
Tech. Terms	-0.45 ± 1.26	-0.19 ± 0.98	-0.39 ± 1.17	-0.04 ± 0.90	-0.07 ± 0.81	-0.01 ± 1.53
Simple Lang.	-0.43 ± 1.31	-0.09 ± 0.96	-0.32 ± 1.18	-0.01 ± 0.68	0.01 ± 0.84	0.01 ± 1.48
Quotes	-0.50 ± 1.27	-0.14 ± 1.07	-0.33 ± 1.18	-0.08 ± 0.93	-0.03 ± 0.76	0.03 ± 1.33
LLM Guid.	-0.32 ± 1.36	0.00 ± 1.13	0.06 ± 1.21	0.02 ± 0.83	-0.09 ± 0.97	0.12 ± 1.60
Content Impr.	-0.29 ± 1.28	-0.13 ± 1.02	-0.08 ± 1.08	-0.13 ± 0.96	-0.09 ± 0.91	0.11 ± 1.48
Best SEO	1.61 ± 1.96	0.93 ± 1.59	0.61 ± 1.48	0.35 ± 1.22	0.31 ± 1.37	0.56 ± 1.81

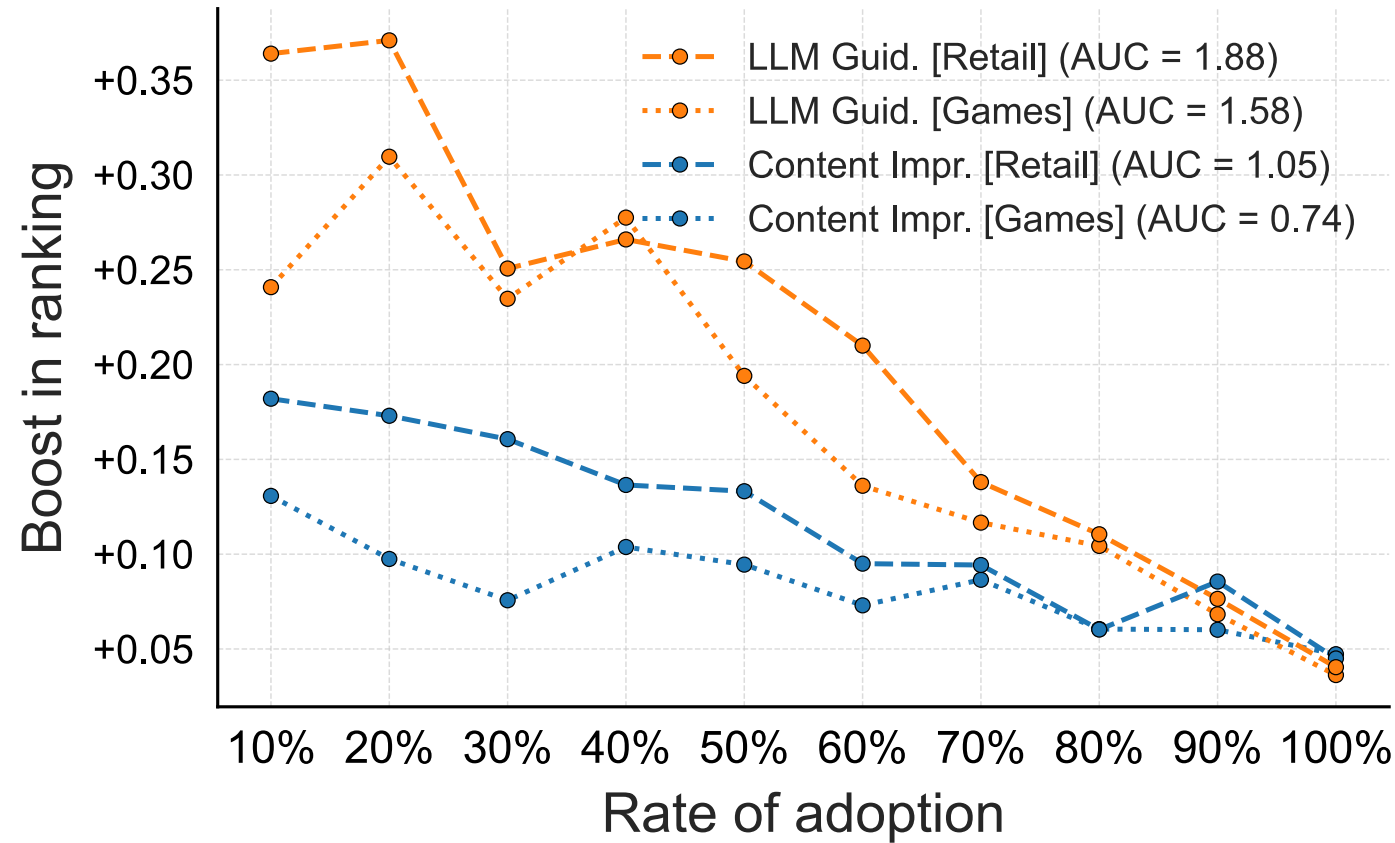
Results on Claude Haiku 3.5

Does SEO Remain Impactful? YES!



- Significant gains by being in top 3 results!
- Top 1 is game changer!

Does Adoption Rate Impact C-SEO?



C-SEO is a
zero-sum
game

Conclusions

- C-SEO is not a replacement for SEO
 - Data providers should keep investing in SEO methods
- Current C-SEO methods are not effective! But they may in the future! They need to evaluate across:
 - Tasks
 - Domains
 - Adoption rate