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THE FUTURE OF RANKBRAIN MACHINE-LEARNING ARTIFICIAL INTELLIGENCE

The Artificial Intelligence That's Now Processing Google Search Results.

A machine-learning AI is handling a large fraction of Google's search queries. RankBrain is a machine-learning artificial intelligence system that helps Google process some of its search results, in particular rare or one-of-a-kind queries. It was launched in early 2015 and is used globally by Google.

RankBrain is primarily focused on helping refine queries that Google processes, but the company says that the system is also used to help rank web pages. In fact, Google says RankBrain is its third most important ranking factor. Move over, Google search algorithm hand-crafted by hard-working Google engineers. RankBrain has moved in, a machine-learning artificial intelligence that Google's been using to process a "very large fraction" of search results per day.

It's not really a complete replacement of the Google search algorithm, also known as Hummingbird, however. The algorithm is the system that processes what people search for and combs through billions of pages to rank the ones believed to be best first.

RankBrain, instead, seems to be about one part of that algorithm, interpreting what someone searches for and understanding how to submit that request in various ways.

For example, someone might search for "Barack." In the past, Google and other search engines might find pages with only that exact word. But over the past few years — and especially since Hummingbird launched in 2013 — Google's gotten better at understanding relationships between words. A search for "Barack" might bring back pages and information that also matches "US President," "Barack Obama," or even "Michelle Obama's husband."

RankBrain seems to be a new way of processing queries like this that goes even further beyond what's been used.

RankBrain uses artificial intelligence to embed vast amounts of written language into mathematical entities — called vectors — that the computer can understand. If RankBrain sees a word or phrase it isn't familiar with, the machine can make a guess as to what words or phrases might have a similar meaning and filter the result accordingly, making it more effective at handling never-before-seen search queries.

RankBrain is one of the "hundreds" of signals that go into an algorithm that determines what results appear on a Google search page and where they are ranked, Corrado said. In the few months it has been deployed, RankBrain has become the third-most important signal contributing to the result of a search query, he said.

A ranking signal is typically something that's associated with the perceived quality of a page, such as the links to it or the words on the page. Google has hundreds of these ranking signals, many of which are summarized in our Periodic Table Of SEO Success Factors.

RankBrain probably isn't really a ranking signal, but rather a query processing tool. Then again, the story goes further in suggesting it's used for ranking.

So far, RankBrain is living up to its AI hype. Google search engineers, who spend their days crafting the algorithms that underpin the search software, were asked to eyeball some pages and guess which they thought Google's search engine technology would rank on top. While the humans guessed correctly 70 percent of the time, RankBrain had an 80 percent success rate.

RankBrain appears to be related to query processing and refinement, using pattern recognition to take complex and/or ambiguous search queries and connect them to specific topics.

This allows Google to serve better search results to users, especially in the case of the hundreds of millions of search queries per day that the search engine has never seen before.

Not to be taken lightly, Google has said that RankBrain is among the most important of the hundreds of ranking signals the algorithm takes into account.

In the past few years, Google has made quite a few important changes to how search works, from algorithm updates to search results page layout. Google has grown and changed into a much different animal than it was pre-Penguin and pre-Panda**.**

These changes don't stop at search, either. The company has changed how it is structured. With the new and separate "Alphabet" umbrella, Google is no longer one organism, or even the main one.

Yet, RankBrain is much different from previous changes. RankBrain is an effort to refine the query results of Google's Knowledge Graph-based entity search. While entity search is not new, the addition of a fully rolled-out machine learning algorithm to these results is only about three months old.

Google does not have this understanding. In fact, according to some, Google is simply navigational search — and navigational search is not considered by definition to be semantic in nature.

Google can understand known entities and relationships via data definitions, distance and machine learning, it cannot yet understand natural (human) language. It also cannot easily interpret attribute association without additional clarification when those relationships in Google's repository are weakly correlated or nonexistent. This clarification is often a result of additional user input.

Of course, Google can learn many of these definitions and relationships over time if enough people search for a set of terms. This is where machine learning (RankBrain) comes into the mix. Instead of the user refining query sets, the machine makes a best guess based on the user's perceived intent.

However, even with RankBrain, Google is not able to interpret meaning as a human would, and that is the Natural Language portion of the semantic definition.

As mentioned, Google is now very good at surfacing specific data. Need a weather report? Traffic conditions? Restaurant review? Google can provide this information without the need for you to even visit a website, displaying it right on the top of the search results page. Such placements are often based on the Knowledge Graph and are a result of Google's move from "strings" to "things."

The move from "strings" to "things" has been great for data-based searches, especially when it places those bits of data in the Knowledge Graph. These bits of data are the ones that typically answer the who, what, where, when, why, and how *questions* of Google's self-defined "Micro-Moments." Google can give users information they may not have even known they wanted at the moment they want it.

However, this push towards entities is not without a downside. While Google has excelled at surfacing straightforward, data-based information, what it hasn't been doing as well anymore is returning highly relevant answers for complex query sets.

Here, I use "complex queries" to refer simply to queries that do not easily map to an entity, a piece of known data and a data attribute — thereby making such queries difficult for Google to "understand."

As a result, when you search for a set of complex terms, there is a good chance you will get only a few relevant results and not necessarily highly relevant ones.

While Google has been experimenting with RankBrain, they have lost market share — not a lot, but still, their US numbers are down. In fact, Google has lost approximately three percent of share since Hummingbird launched, so it seems these results were not received as more relevant or improved (and in some cases, you could say they are worse).

Google might have to decide whether it is an answer engine or a search engine, or maybe it will separate these and do both.

Unable to produce a semantic engine, Google built one based on facts. RankBrain has now been added to help refine search result because entity search requires not only understanding what the nouns in a search mean, but also how they are related.