VISUAL SEARCH STUDY: HOW GOOGLE RANKS GOOGLE LENS RESULTS

Methods

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BACKGROUND

The goal of this research was to unearth any information on how Google Lens works, given the absence of other studies of this kind. We wanted to see if and how on-page factors that influence a site's position in the normal Google results (like meta title, meta description, content length, image placement, filename, etc.) correlated with a site's likelihood of being chosen as a Google Lens search result.

As far as we're aware, this is the first large-scale analysis of Google Lens search results. We therefore chose to analyze specific ranking factors based largely on Google's own documentation about website image optimization as well as statements from Google about visual search.

The main limitation of our study is sample size. We have analyzed 65,388 Google Lens results (from 16347 search images). While our study is unique, we recognize that this sample size could be improved upon in future versions of this work.

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Performing a search in Google Images – via a mobile device – gives the option, for each image result, of using that image as a search source in Google Lens.

This "Google Lens via Google Images on a mobile device" search process can be briefly detailed as:

- Navigate to images.google.com via a mobile device
- Search for a keyword
- Press on the first image result in the list, which puts it into a fullscreen modal dialog
- Press the Google Lens icon that appears above this fullscreen image
- The Google Lens 'tray' will slide in, revealing Google Lens results for this search image

We deemed this to be the only viable approach for undertaking a large-scale study on Google Lens, given its ease of integrating into our existing team skillset (web scraping, etc.), and the relative ease of scaling up this process programmatically.

The two rejected alternative approaches, at the time of undertaking this study, would have been to either reverse-engineer the Google Lens android app (or the Lens feature of the Google App on iPhone), which would have been costly and time-consuming, or to manually perform these searches with original images and real users. This would have required a large, co-ordinated team of human workers, each running photos in Google Lens, then manually logging information about the results. The amount of data required and domain-specific expertise, along with original photos, would have rendered this approach extremely costly and time-consuming, along with a high potential for error at various stages.

Using the "Google Lens via Google Images on a mobile device" approach described above, and in order to perform the highest number of Google Lens searches that – as closely as possible – reflected real-world search trends, we performed the first stage Google Images searches using keywords from Google Trends. We pulled the maximum number of keywords possible from Google Trends, which was 18,076.

To get 18,076 keywords from Google Trends, we pulled an equal proportion of keywords from all available categories and subcategories (1,426 in total).

The maximum number of keywords pulled from a given category/subcategory was 25.

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In Google Trends, the Location attribute was set to "United States", the Date attribute was set to "Past 12 months" and Google Property attribute was set to "Images".

We settled on these properties for obvious reasons – Google US is effectively the canonical search engine for all data studies. The past 12 months give a good balance of fresh but not total fad searches, and the Images Google Property, given we would be 'translating' the keywords into search images, and then conducting the study, seemed most appropriate for this end.

We then programmatically searched with these keywords in Google Images, using Headless Chrome with Selenium.

We chose to emulate an iPhone X device using the latest version of Google Chrome for performing our searches. This is because the chosen device/browser combination is modern, and the device has a similar screen width to the average among many other devices on the market at the time of undertaking this study (iPhone X: 375px, Galaxy S5: 360px, iPhone 6/7/8: 375px).

Having said this, the specific mobile device is unimportant in that, for nearly all mobile devices used today in the portrait orientation, Google Images (and Google Lens running inside of Google Images) renders results in a two-column layout with 'infinite' rows.

To summarize, the entire browser emulation phase was essentially this: https://imgur.com/a/Bc79N8q – Searching with a keyword, clicking on the first Images result, searching in Google Lens for that image, then logging the first four results (from left to right).

We chose to record the first four results under the assumption that they are the most frequently used. This is based on the amount of the phone screen that they fill (prominence), and the fact that subsequent results require scrolling on many devices. However, given that we believe this is the first study of its kind, we don't have objective data to support these assumptions.

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We saved – into a MySQL database – this initial information:

- Search keyword
- Search keyword number one Google Images result (Google US), as URL

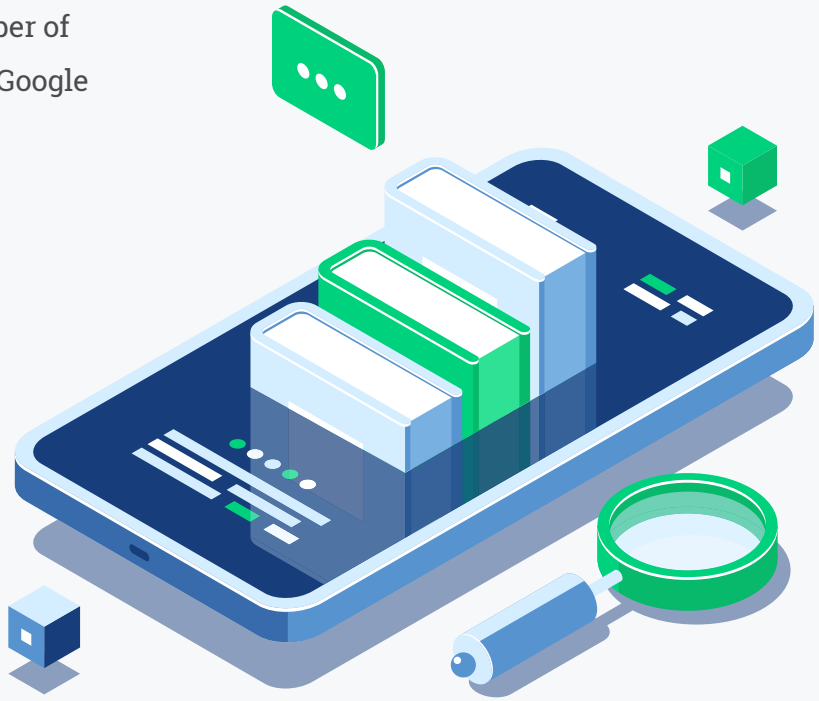
We then saved, for each of the four Google Lens results, the following information:

- Google Lens-chosen image
- URL from which the Google Lens-chosen image was sourced

From this base-level data, we were then able to undertake further analysis, which is detailed below.

Note: Of the 18,076 search images, some resulted in various forms of error results, and so were discounted from the study (all of their four Google Lens image 'child' results, if any, were removed, along with the search image). Of the remaining search images, some had an error in one or more of their 'child' Google Lens results, and therefore all of the Google Lens results (the error, and its three 'siblings') and the search image were discounted.

After this data cleaning, the total number of search images was 16,347, with 65,388 Google Lens results.



FURTHER ANALYSIS

We then gathered the following data from the Lens results:

- Meta title of web page that Lens-chosen image comes from
- Meta title length of web page that Lens-chosen image comes from
- Meta description of web page that Lens-chosen image comes from
- Meta description length of web page that Lens-chosen image comes from
- Ten most common TLDs in Lens results
- Ten most common domain names in Lens results
- Number of "other" domains in Lens results (not in top 10)
- Number of social network domains in lens results
- Number of results with HTTPS and HTTP schemes
- Average URL length
- Average word count
- Average number of images on the web page that Lens-chosen result came from
- Average number of images with alt text on the web page that Lens-chosen result came from
- Average number of images without alt text on the web page that Lens-chosen result came from
- Average number of images with title text on the web page that Lens-chosen result came from
- Average number of images without title text on the web page that Lens-chosen result came from
- Average number of images with alt text or title text on the web page that Lens-chosen result came from
- Average number of images without alt text or title text on the web page that Lens-chosen result came from
- Is the Lens-chosen image in the top 25% of the web page that it comes from?
- Is the Lens-chosen image responsive, on the web page that it comes from?
- Various PageSpeed insights (First contentful paint, first meaningful paint, etc)
- Are any of the SEMrush "top 5 keywords" for the URL found in the URL of the lens-chosen image's page?*
- Are any of the SEMrush "top 5 keywords" found in the image filename of the lens-chosen image?*
- Is the Google Vision API best-guess keyword for the Lens-chosen image found in the URL of the web page that the Lens-chosen image came from?*
- Is the Google Vision API best-guess keyword for the Lens-chosen image found in the image filename of the Lens-chosen image?*

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- Is the Google Vision API best-guess keyword for the Lens-chosen image found in the image alt text of the Lens-chosen image?*
- Is the Google Vision API best-guess keyword for the Lens-chosen image found in the image title text of the Lens-chosen image?*
- Is the Google Vision API best-guess keyword for the Lens-chosen image found in the page title tag of the web page that the Lens-chosen image came from?*
- Is the Google Vision API best-guess keyword for the search image the same as the Google Vision API best-guess keyword for the Lens-chosen images?*
- Are any of the top 5 SEMrush keywords for the URL the same as the Google Vision API best-guess keyword for the Lens-chosen image?*
- Does the URL for the web-page that the Lens-chosen image came from rank on the first page when searching with the best-guess keyword for the Lens-chosen image?*
- Does any page of the website (including but not limited to the URL) for the web-page that the Lens-chosen image came from rank on the first page when searching with the best-guess keyword for the Lens-chosen image?*
- Average external link count for web page that Lens-chosen image came from
- Average internal link count for web page that Lens-chosen image came from
- Average total link count for web page that Lens-chosen image came from
- Average Moz Page Authority for web page that Lens-chosen image came from*
- Average Moz Domain Authority for web page that Lens-chosen image came from*
- Is web page that Lens-chosen image came from Mobile Friendly?*

* = Relies on third-party APIs. Number of returned results not always equal to the total number of Google Lens results.

FURTHER ANALYSIS

Any calculation based on results from third-party APIs was presented as a percentage of results with successful API responses, rather than a percentage of the entire dataset – For example, 58,959 of the 65,388 Lens results had a response from Google Vision's API, therefore stats like "33% of Google Vision API best-guess keywords for the chosen Lens image were found in the URL of the page" refers to 33% of 58,959, etc.

Calculations based on scraped data (meta title length, etc) were unaffected by this, so are based on 100% of 65,388 Lens results.

With the above caveat, all analysis was undertaken on the full dataset.