

- Full name: Iván Kaleb Ramírez Torres
- NAO ID: 3357
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- Name of the pathway in which you are enrolled: Bécalos Techno Ready
- Title of the Challenge: **Challenge 3 – Server and Database Commands**

Technical Report: Google Scholar API (via SerpApi)

1. Endpoints

The Google Scholar API is accessed through **SerpApi** endpoints. The base endpoint is:

<https://serpapi.com/search>

To specify Google Scholar as the data source, the engine parameter must be set to "google_scholar".

Examples of specific endpoints:

- **Scholar Articles Search**
 - https://serpapi.com/search?engine=google_scholar&q=machine+learning
 - **Scholar Author Profile**
 - https://serpapi.com/search?engine=google_scholar_author&author_id=XXXX
 - **Scholar Citations**
 - https://serpapi.com/search?engine=google_scholar_cite&q=XXXX
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2. Authentication Methods

To access the API, you need an **API key** provided by SerpApi:

- Sign up at <https://serpapi.com>.
- Find your **API key** in the account dashboard.
- Include the key as a query parameter in each request:

https://serpapi.com/search?engine=google_scholar&q=nanomaterials&api_key=YOUR_API_KEY

3. Query Parameters

Some of the most important query parameters are:

- **q**: The search query (e.g., q=artificial+intelligence).
- **engine**: Must be set to "google_scholar", "google_scholar_author", or "google_scholar_cite".
- **hl**: Language of the results (e.g., hl=en).
- **num**: Number of results per page (default 10, max 20).
- **start**: Pagination offset (e.g., start=10 for results 11–20).

- **author_id**: Required for author profile lookups.
- **api_key**: Your authentication key.

Example:

https://serpapi.com/search?engine=google_scholar&q=quantum+computing&num=20&hl=en&api_key=YOUR_API_KEY

4. Response Formats

Responses are returned in **JSON** format. A typical result includes structured fields such as:

```
{
  "search_metadata": {
    "status": "Success",
    "query": "machine learning",
    "engine": "google_scholar"
  },
  "organic_results": [
    {
      "title": "Machine learning: Trends, perspectives, and prospects",
      "link": "https://www.science.org/...pdf",
      "snippet": "Machine learning is transforming science...",
      "authors": ["M Jordan", "T Mitchell"],
      "publication_info": {
        "summary": "Science, 2015"
      },
      "cited_by": {
        "value": 12034,
        "link": "https://scholar.google.com/scholar?cites=..."
      }
    }
  ]
}
```

5. Usage Limits

- **Free Plan**: Limited to **100 searches per month**. (I'll use this one)
 - **Paid Plans**: From **\$50/month** (5,000 searches) and upwards.
 - **Rate Limits**: Typically 1 request per second per API key to avoid throttling.
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6. Code Examples

Python

```
1  import requests
2
3  params = {
4      "engine": "google_scholar",
5      "q": "machine learning",
6      "api_key": "YOUR_API_KEY"
7  }
8
9  response = requests.get("https://serpapi.com/search", params=params)
10 data = response.json()
11
12 for result in data["organic_results"]:
13     print(result["title"], "-", result["link"])
14
```

JavaScript (Node.js)

```
1  const axios = require('axios');
2
3  (async () => {
4      const response = await axios.get("https://serpapi.com/search", {
5          params: {
6              engine: "google_scholar",
7              q: "nanotechnology",
8              api_key: "YOUR_API_KEY"
9          }
10     });
11
12     response.data.organic_results.forEach(r => {
13         console.log(r.title, "-", r.link);
14     });
15 })();
16
```

cURL

curl

"https://serpapi.com/search?engine=google_scholar&q=artificial+intelligence&api_key=YOUR_API_KEY"