

Topic or Topics | March 20, 2024

# Prompt Engineering, Generative AI, and Drupal



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**IMF:**  
**40% of jobs globally, or  
60% of jobs in advanced  
economies, will be  
impacted by the growing  
adoption of AI**

# READ THE ROOM

**In order to replace  
developers, customers will  
need to clearly state their  
requirements.**

**We're safe.**

# What is Artificial Intelligence?

# TERMINOLOGY

**Artificial Intelligence (AI):** field of study in computer science that develops and studies **intelligent machines**, often by **mimicking human responses**, or **automating sophisticated behaviour**.

**Natural Language Processing  
(NLP):** working with text  
provided in a **conversational  
format**, understanding the  
**intended meaning**, and  
providing a **relevant response**.



**Machine Learning (ML):**  
a subset of AI which allows  
systems to act **without explicit  
instructions**, by leveraging  
statistical algorithms to  
**extrapolate existing data** to  
unknown use cases.

**Deep Learning:**  
a subset of ML, which uses  
artificial neural networks with  
representational learning, which  
allows them to develop and  
**leverage their own means of  
classification** and other feature  
detection.

# **Large Language Model (LLM):**

an AI algorithm that uses Deep Learning techniques to accomplish NLP tasks such as **responding to unstructured user prompts**. LLMs are trained on **massive data sets**, often gathered from the internet, but sometimes using more **specialized data**

# How can we get the best output from our LLMs?

# Prompt Engineering

- Providing **structure** and **additional information** to your query to get the results you're after
- Can include **examples** to teach the LLM the pattern you want it to follow
- Can specify the **format** in which the output should be returned

# The Structure of an AI Prompt

Please do a **comical play on the lyrics**

→ **Format**

of **Holy by Justin Bieber**

→ **Reference**

but **center the song on Mr. Smith,**

→ **Request**

*(poem about my dog)*

**my dog. He is a Coton De Tulear. His**

**girlfriend is our other dog, Baby Jane,**

→ **Framing**

**who is a Lhasa Apso.**

NNGROUP.COM **NN/g**



**You**

write a Shakespearean sonnet about the beauty and ease of use of the Drupal CMS



**ChatGPT**

Upon a digital stage, Drupal shines bright,  
A framework of elegance, vast and free,  
Its modules, like stars, guide through the night,  
Offering paths to build and paths to see.

In lines of code, a symphony composed,  
Where ease and beauty hand in hand doth dance,  
A CMS where creativity's enclosed,  
Within its bounds, all find a chance to enhance.

From themes that dress each page in finest wear,  
To plugins that extend its reach so wide,  
Drupal's artistry is beyond compare,  
A crafty architect's joy and pride.

So here in Shakespeare's tongue, we do confess,  
Drupal's beauty and ease outshine the rest.



**You**

write a Shakespearean sonnet about the beauty and ease of use of the Drupal CMS, mentioning its creator Dries

< 2 / 2 >



**ChatGPT**

When first I met thee, Drupal, in mine quest,  
To weave the web with craft so fine and fair,  
Thy structure, like a fortress, stood the test,  
With modules rich, and themes beyond compare.

Dries, thy creator, with vision so keen,  
Didst mold thee from the digital clay,  
A tool for all, both the great and the mean,  
To shape their dreams by night or by day.

Thou art a garden where content doth grow,  
With ease of use, thy branches spread wide,  
Where novices and experts alike may show  
The fruits of their labor, side by side.

In forums, thy community doth thrive,  
Each problem found, a solution contrived.

So here I sing, with heart so full and bright,  
Of Drupal, whose use doth bring such delight.  
Its beauty lies not in its face alone,  
But in its power to make the web our own.

Through Dries' guidance, a path was carved clear,  
For all who wish to draw their visions near.  
So let us praise this system, so profound,  
In every corner of the web, it's found.



# How can AI be useful in Drupal websites?

# AI TEXT GENERATION

# AI Text Generation

- Fine for general topics
- Risk of “hallucinations”
- Ethical issues to consider
- Limitations on recency of input data

# AI TEXT AUGMENTATION

# OpenAI



- CKEditor options to generate content, change style, and more
- Content tools to manipulate content in similar ways, plus suggest tags and more
- Simple to set up, just add API key and enable features you want
- Requires Drupal 10

# Augmentor AI

- Works with multiple LLMs
- Define Augmentors as configuration entities, optionally including prompt structure elements
- Works with Drupal 9 and 10

# DEMO: Generating Content and Metadata

# OpenAI

- Easy to set up
- Lots of submodules
- Frequently updated e.g. as APIs change

# Augmentor AI

- Very configurable
- Supports multiple LLMs
- Opportunity to build in Prompt Engineering



# AI Interpolator

- Designed to work in the back end, generating field values
- No creator widgets
- Lots of service integrations

# IMAGE GENERATION

# Image LLMs

- Midjourney, DALL-E, Stable Diffusion, and others
- *“**Midjourney** might produce the best-looking images even without sophisticated prompts, but **Stable Diffusion** will act more consistently and make fewer errors. On the other hand, **Dall-e** is likely to make the most accurate semantic interpretation and interpolation judgments.”*

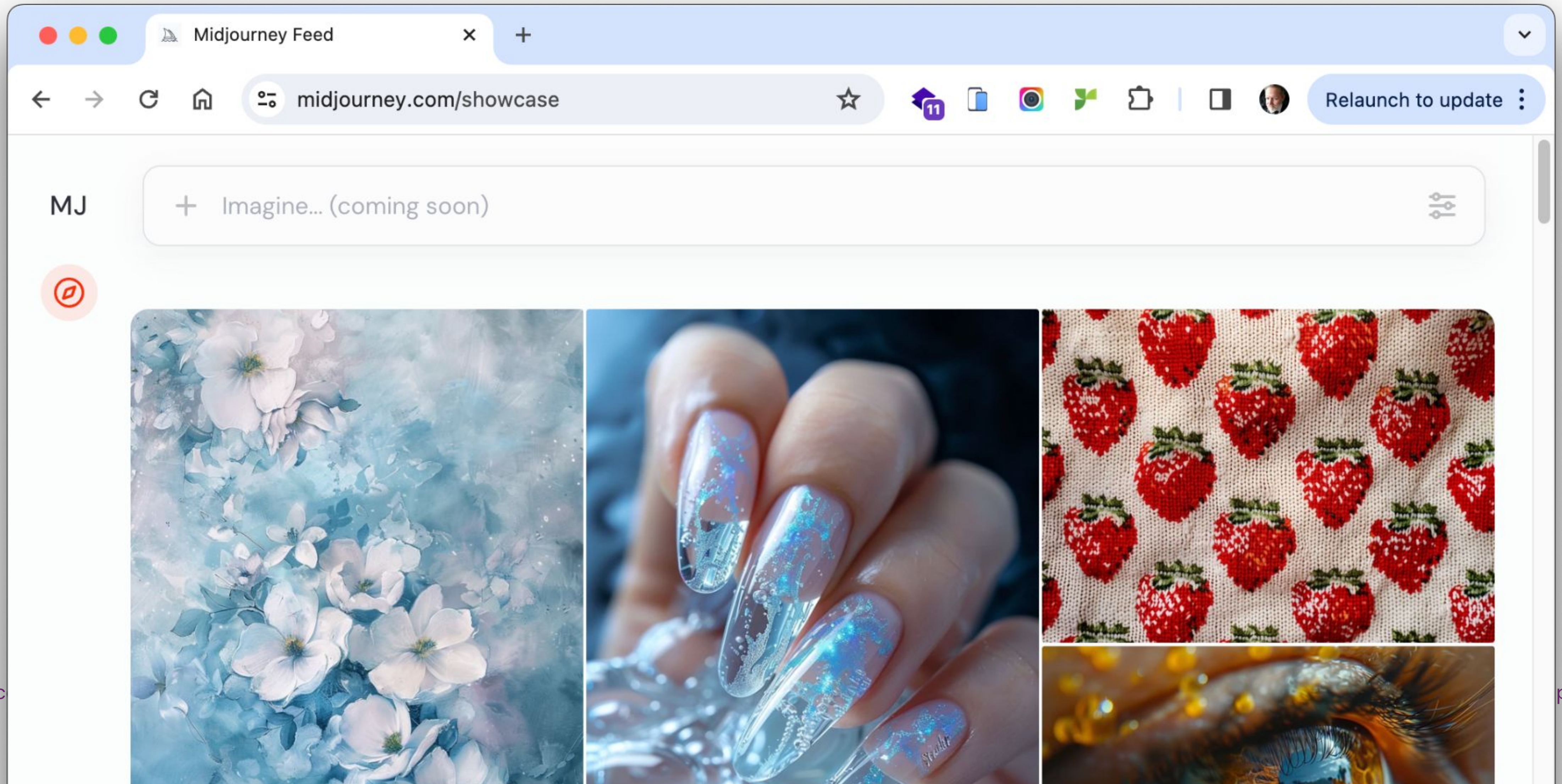
# Image LLMs

- **DALL•E:** part of paid plan (min \$20/mo)
  - API access available
- **Midjourney:** free trial, paid for ongoing use
  - Access through Discord, no direct API
- **Stable Diffusion:** open source
  - Available in websites, or run locally

# Image Prompts

- Describe what to include
- Additional, optional elements can include:
  - Resolution
  - Style and/or artist to emulate
  - Tone and/or lighting
  - Photographic treatments like film style, depth of focus, lens length, etc

# Midjourney Showcase



# Midjourney Showcase

The screenshot displays the Midjourney web interface. At the top, a browser window shows the URL `midjourney.com/jobs/c3d9cdf3-b8bf-4097-b8b0-c...`. Below the browser, the Midjourney logo 'MJ' is visible on the left. A search bar contains the text '+ Imagine... (coming soon)'. The main content area features a large generated image of a man with a rugged, futuristic appearance, wearing a tattered grey scarf and looking intensely at the camera. To the right of the image, the following text is displayed: 'draxthar1 4h', 'Shot 3: DISTANT SHOT of a futuristic version of Sean O'Pry wearing ragged desert clothes in a contemplative stance. Macro lens. Camera Movement: Static.CINEMATIC PRODUCT VIDEO high-end image still, elegant, detailed, daylight key and kicker light, 35MM macro, fx3, f/2.8,' and 'ar 2:1'. On the far right, a vertical strip of smaller image thumbnails is visible. The bottom left corner of the image has the text 'midc' and the bottom right corner has 'p.org'.

# Midjourney Showcase

The screenshot shows a web browser window with the Midjourney Feed. The browser's address bar displays the URL `midjourney.com/jobs/899ae7e5-c153-417b-abe4-d...`. The page features a search bar with the placeholder text "Imagine... (coming soon)". Below the search bar, a large generated image is displayed. The image is a high-contrast, white-line drawing on a black background, depicting a black cat with a crescent moon on its forehead, surrounded by radiating lines and stars. To the right of the image, the user "shroomr" is credited, and the post is dated "7h". The prompt for the image is: "Generate outlined art of a black cat reading tarot cards. Please use a vector style with bold white lines, high contrast. Ultra high quality line drawing, weird and surreal. white lines on black background. Occult symbolism". Below the prompt, the aspect ratio "ar 3:4" and the style parameter "stylize 250" are visible. A vertical strip of smaller generated images is shown on the right side of the page.

MJ

+ Imagine... (coming soon)

shroomr 7h

Generate outlined art of a black cat reading tarot cards. Please use a vector style with bold white lines, high contrast. Ultra high quality line drawing, weird and surreal. white lines on black background. Occult symbolism

ar 3:4 stylize 250



# Chaining

- Use an LLM like ChatGPT to generate a detailed image prompt



## Image Prompt Generator

By [henry chien kang teck](#) 

I craft midjourney format prompts by giving me the subject and action and style. Default will be photorealistic, cinematic and anime style. It can be used in other text to image AI too.

# AI Image Generation in Drupal

- OpenAi Dalle (submodule)
- OpenAI Images
  - Can save the image to the media library

# DEMO: Generating Images

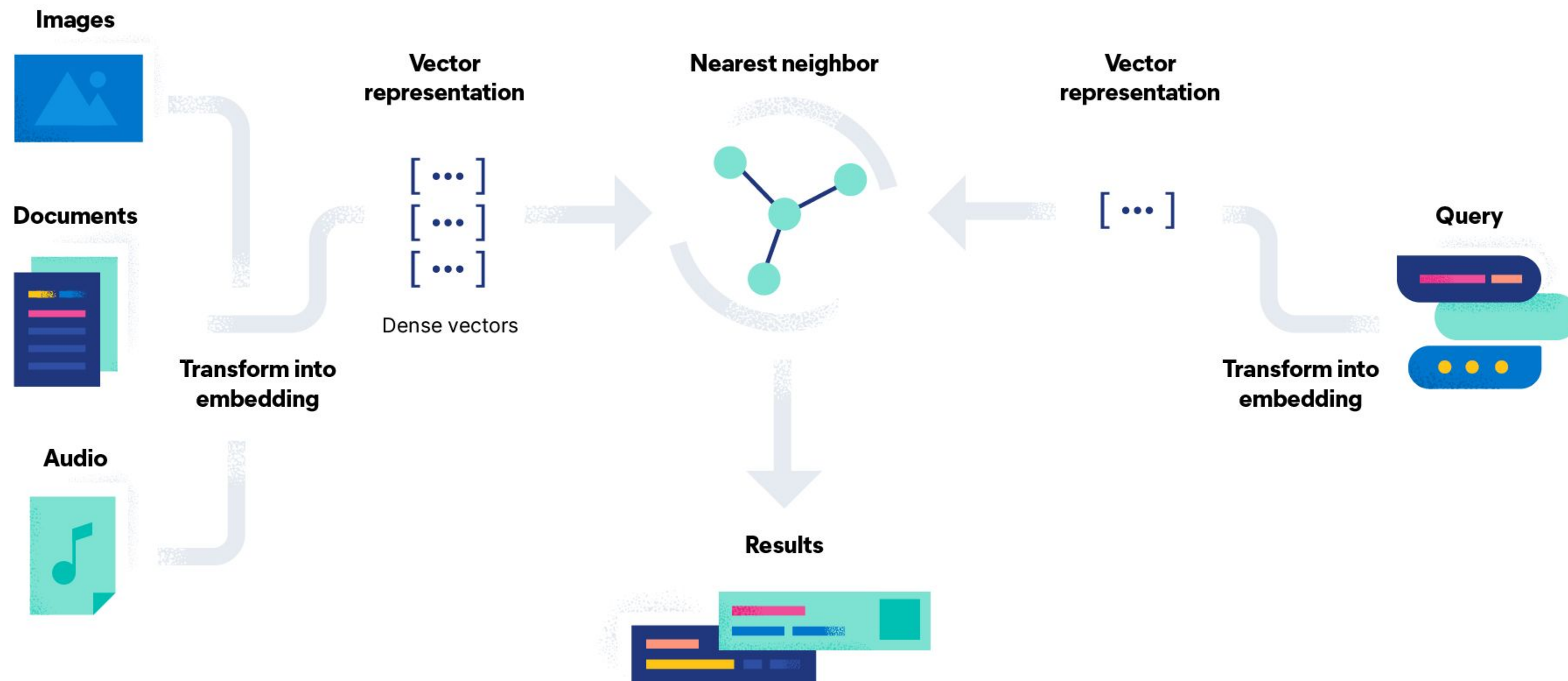
# VECTOR SEARCH

# What Is Vector Search?

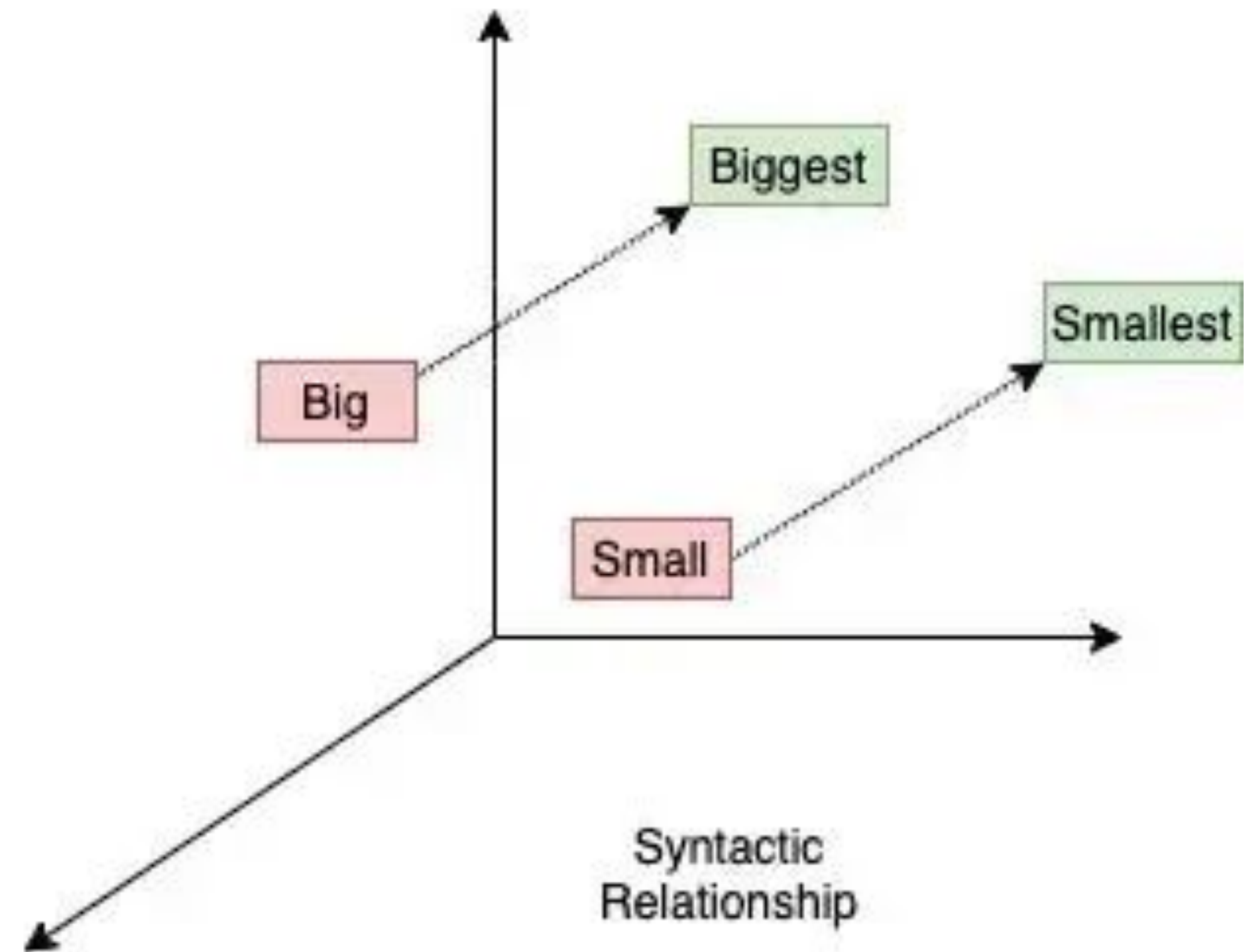
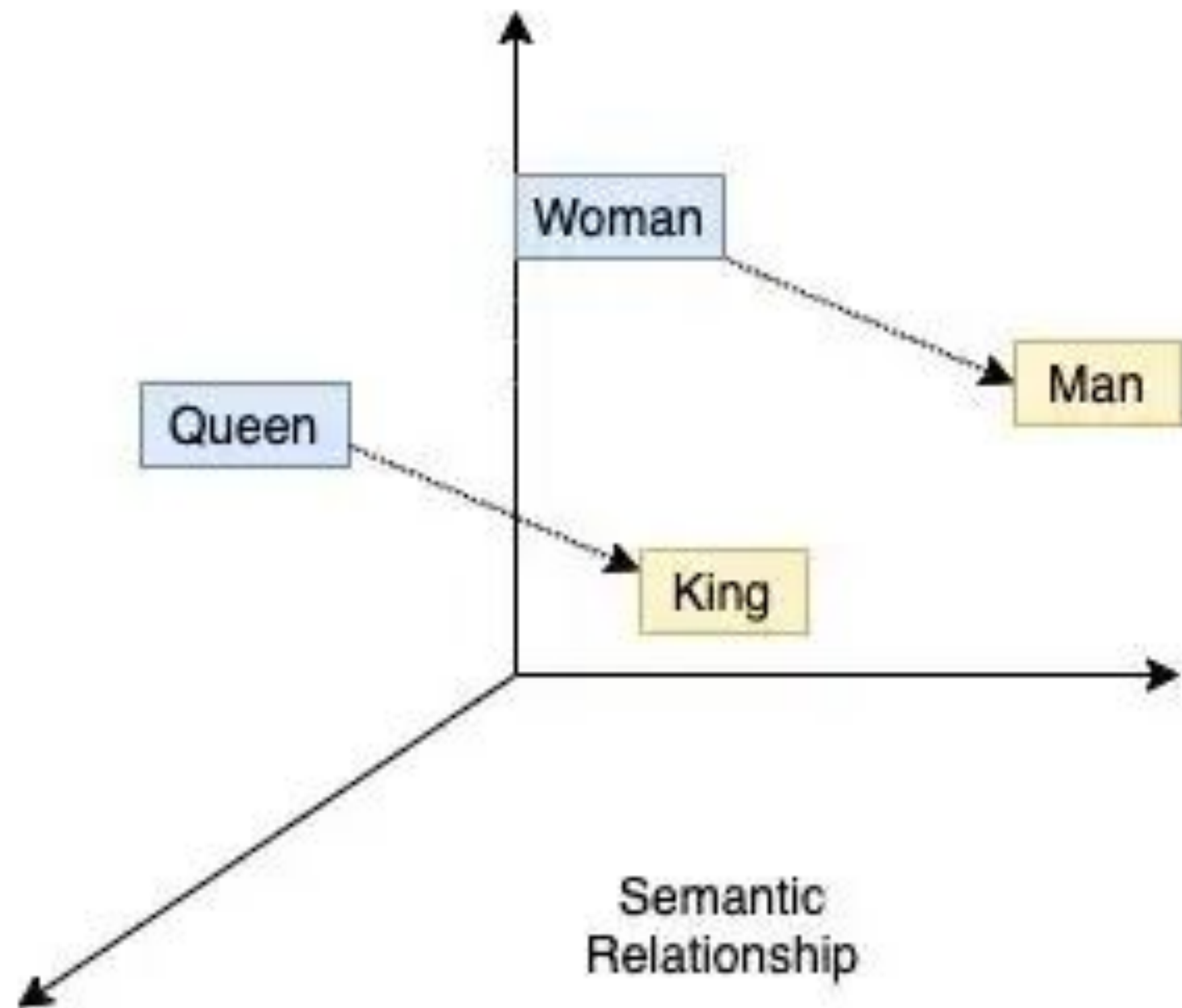
*“Vector search leverages machine learning (ML) to capture the meaning and context of unstructured data, including text and images, transforming it into a numeric representation. Frequently used for semantic search, vector search finds similar data using approximate nearest neighbor (ANN) algorithms. Compared to traditional keyword search, **vector search yields more relevant results and executes faster.**”*

– [elastic.com](https://www.elastic.com)

# What Is Vector Search?



# Vectorization



**king – man + woman = queen**



# Vector Search and Drupal

- Search API Pinecone
- Search API Weaviate
- Search API Milvus
- Search API Embeddings
- OpenAI Embeddings (submodule)

# (Other) Search and Drupal

- Search API AI
  - Works with Pinecone and OpenAI
- Search API Solr NLP

# WRITING CODE

# Drupal Droid

The screenshot shows a web browser window with a dark theme. The browser's address bar displays the URL `chat.openai.com/g/g-rNIZzTk3G-the-drupal-droid`. The page title is "ChatGPT - The Drupal Droid". The main content area features a header for "The Drupal Droid" with a dropdown arrow. Below this is a circular logo for the GPT, followed by the title "The Drupal Droid" and the author "By Michael Miles" with a globe icon. A description reads: "Programming assistant for Drupal 9+ website configuration and coding." On the left sidebar, the ChatGPT logo is at the top, followed by "Explore GPTs". Under the "Today" section, there are several chat history items: "Vader Samurai Art Concept", "No image generation.", "Acquia: Best Drupal Hosting", "Pantheon Dev Tool Limitations", and "Learning Drupal Basics." The "2023" section is currently empty.

- ChatGPT
- The Drupal Droid
- Explore GPTs

Today  
Update Hook for Smart Date ...

- Previous 7 Days
- Vader Samurai Art Concept
- 2023
- No image generation.
- Acquia: Best Drupal Hosting
- Pantheon Dev Tool Limitations
- Learning Drupal Basics.

### The Drupal Droid

**You**  
Write an update hook to resave the storage schema for Smart Date fields

**The Drupal Droid**  
Gotcha! You want to write an update hook that triggers a resave of the storage schema for Smart Date fields in Drupal. This typically involves making a change that affects the database schema for these fields, and you'll want to ensure that Drupal recognizes and applies these changes. Here's a simplified approach to confirm I've got this right:

1. Identify the Smart Date fields that need their storage schema updated.
2. Implement an update hook in a custom module.
3. In the update hook, programmatically resave the field storage configurations to trigger Drupal to update the database schema for these fields.

Does this align with what you were thinking?





Today

Update Hook for Smart Date ...

Previous 7 Days

Vader Samurai Art Concept

2023

No image generation.

Acquia: Best Drupal Hosting

Pantheon Dev Tool Limitations

Learning Drupal Basics.

php

Copy code

```
/**
 * Resaves the storage schema for Smart Date fields.
 */
function my_custom_module_update_8001() {
  // Load field storage configurations for Smart Date fields.
  $field_storages = \Drupal::entityTypeManager()
    ->getStorage('field_storage_config')
    ->loadByProperties(['type' => 'smartdate']);

  foreach ($field_storages as $field_storage) {
    // Check and update the field storage schema if necessary.
    \Drupal::service('field_storage_definition.listener')
      ->onFieldStorageDefinitionUpdate($field_storage, $field_storage);
  }

  return t('Smart Date field storage schemas have been updated.');
```

### Explanation:

- **Loading Smart Date Fields:** This script loads all field storage configurations for fields of type `smartdate`. Adjust the ` 'type' => 'smartdate' ` part if your field type identifier differs.
- **Updating Schema:** For each Smart Date field storage, it invokes the schema update process. This effectively checks and updates the schema for each Smart Date field storage configuration without needing to manually adjust the database.
- **Return Message:** Provides a return message indicating the operation's completion. This is helpful for logs and UI messages to inform you that the process has run.

### After Implementing



# RESOURCES

# Additional Reading

- [NNGroup: Prompt Structure in Conversations with Generative AI](#)
- [Magical: How to Write Good AI Prompts: A Beginner's Guide \(+12 Templates\)](#)
- [Overview of Drupal AI modules in one place](#)
- [AI Will Transform the Global Economy. Let's Make Sure It Benefits Humanity.](#)
- [12 New Jobs For The Generative AI Era](#)
- [AI Prompt Engineers are Making \\$300k/y](#)
- [What Is Vector Search?](#)



# Additional Reading

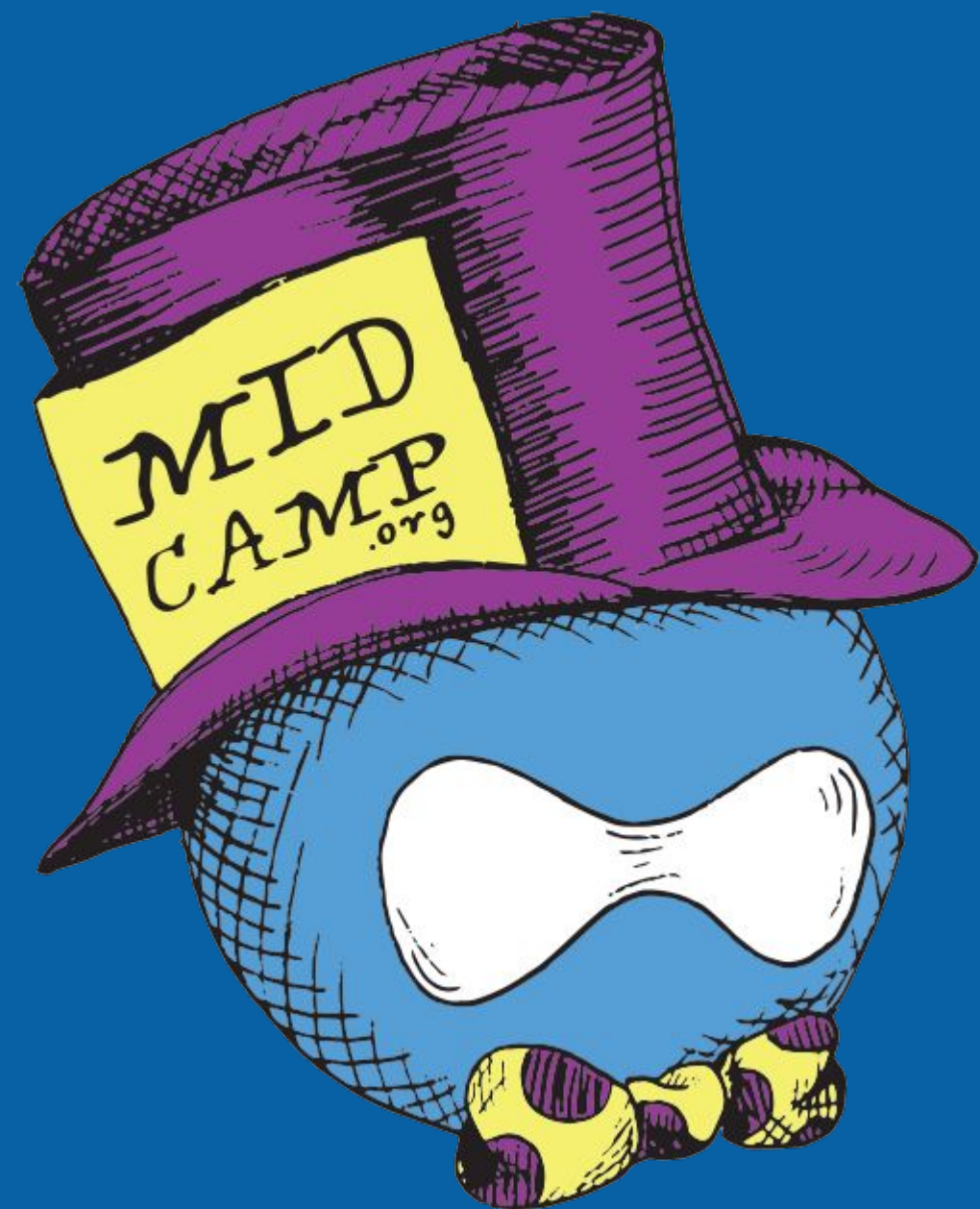
- [How to use Stable Diffusion AI to create amazing images](#)
- [AI Art Prompts 101: Tips and Templates to Get You Started](#)
- [How to write effective AI art prompts](#)
- [Researchers from Stanford and OpenAI Introduce 'Meta-Prompting': An Effective Scaffolding Technique Designed to Enhance the Functionality of Language Models in a Task-Agnostic Manner](#)

**ONLY WAY TO KEEP  
AI FROM TAKING YOUR JOB**

**IS TO USE AI TO  
DO YOUR JOB BETTER**

# PLEASE PROVIDE YOUR FEEDBACK!

[mid.camp/8517](https://mid.camp/8517)



# CONTRIBUTION DAY

## Friday 10am to 4pm

You don't have to know code to give back!

New Contributor training 10am to Noon  
with **AmyJune Hineline** of [Opensource.com](https://opensource.com)

**THANK YOU,  
QUESTIONS?**