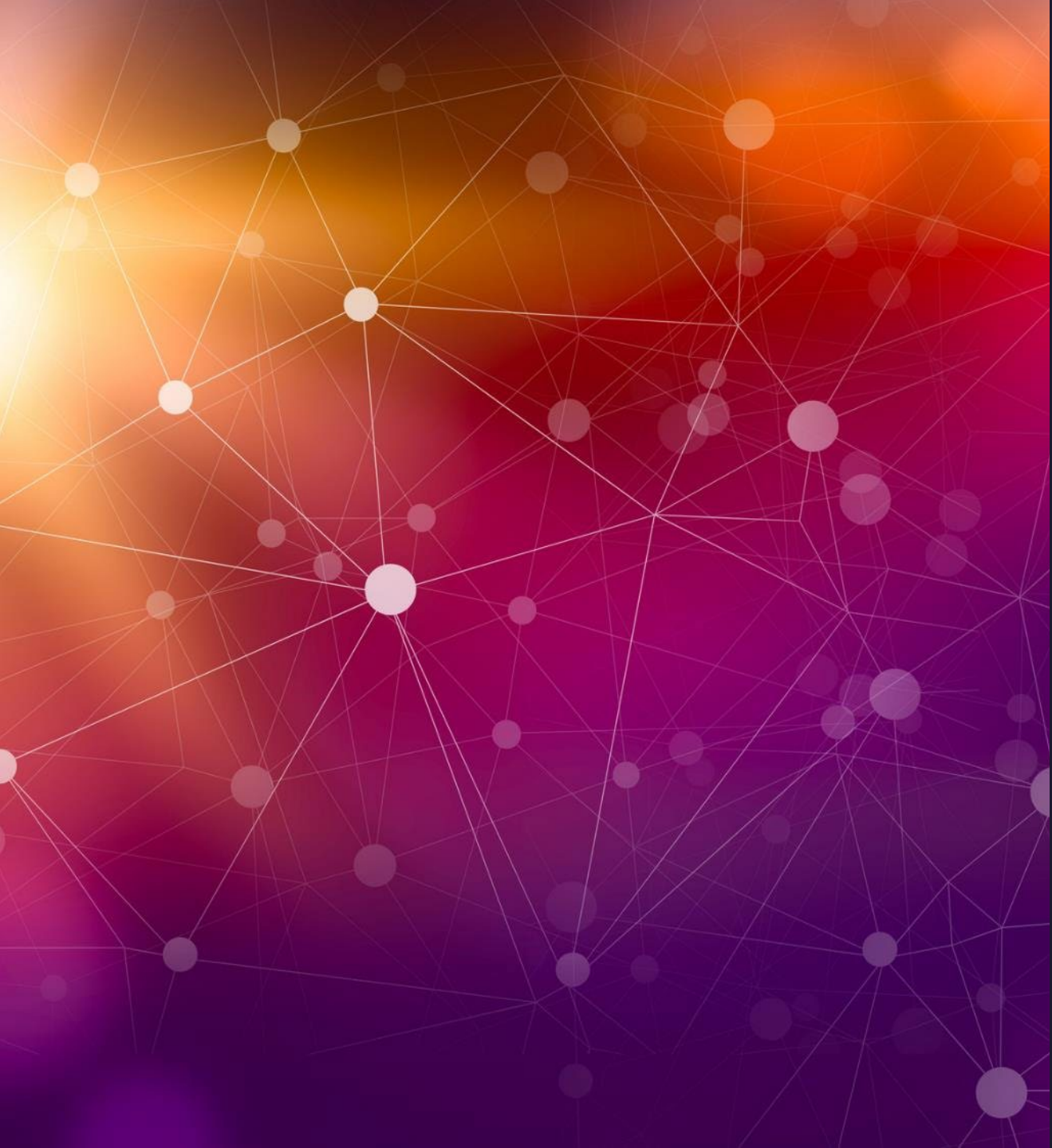




# Utilizing AI Vector Search of Oracle Database 23ai using Oracle APEX



# About me

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X [@alhadara](#)

# Agenda

Introducing Vectors

Dimensions in our world

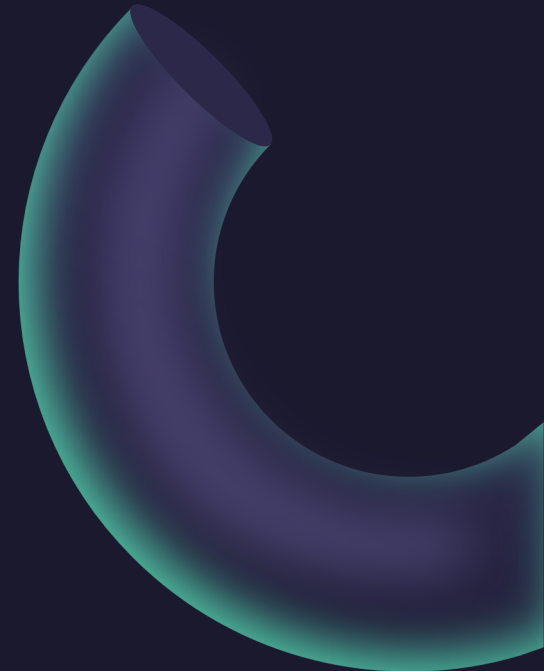
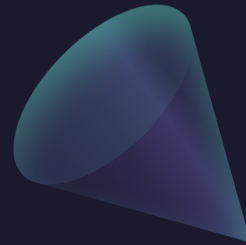
Vector Types

Vector Models

Semantic Search

Oracle APEX Vector Support

Demo!

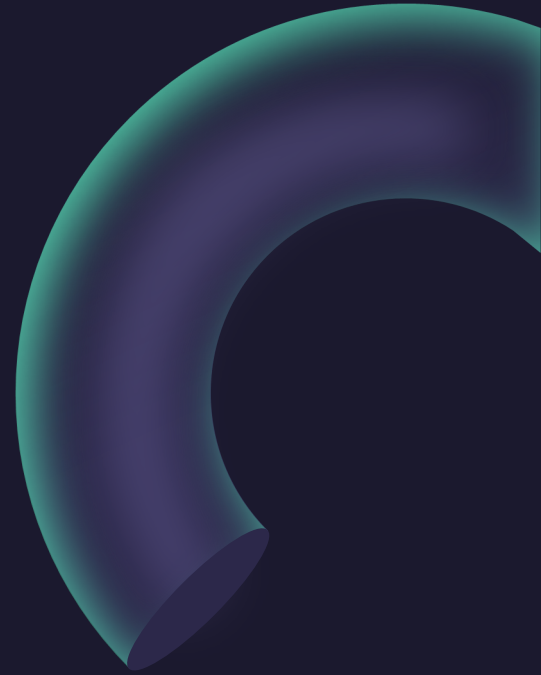
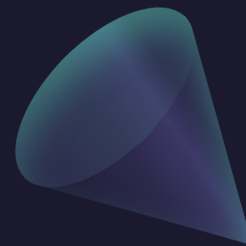






# The power of Vectors

# What is a Vector?



# Multi-Dimensional World





# Dimensions



# Vector Types

**APEX**

**Most Advanced  
Enterprise Low  
Code**



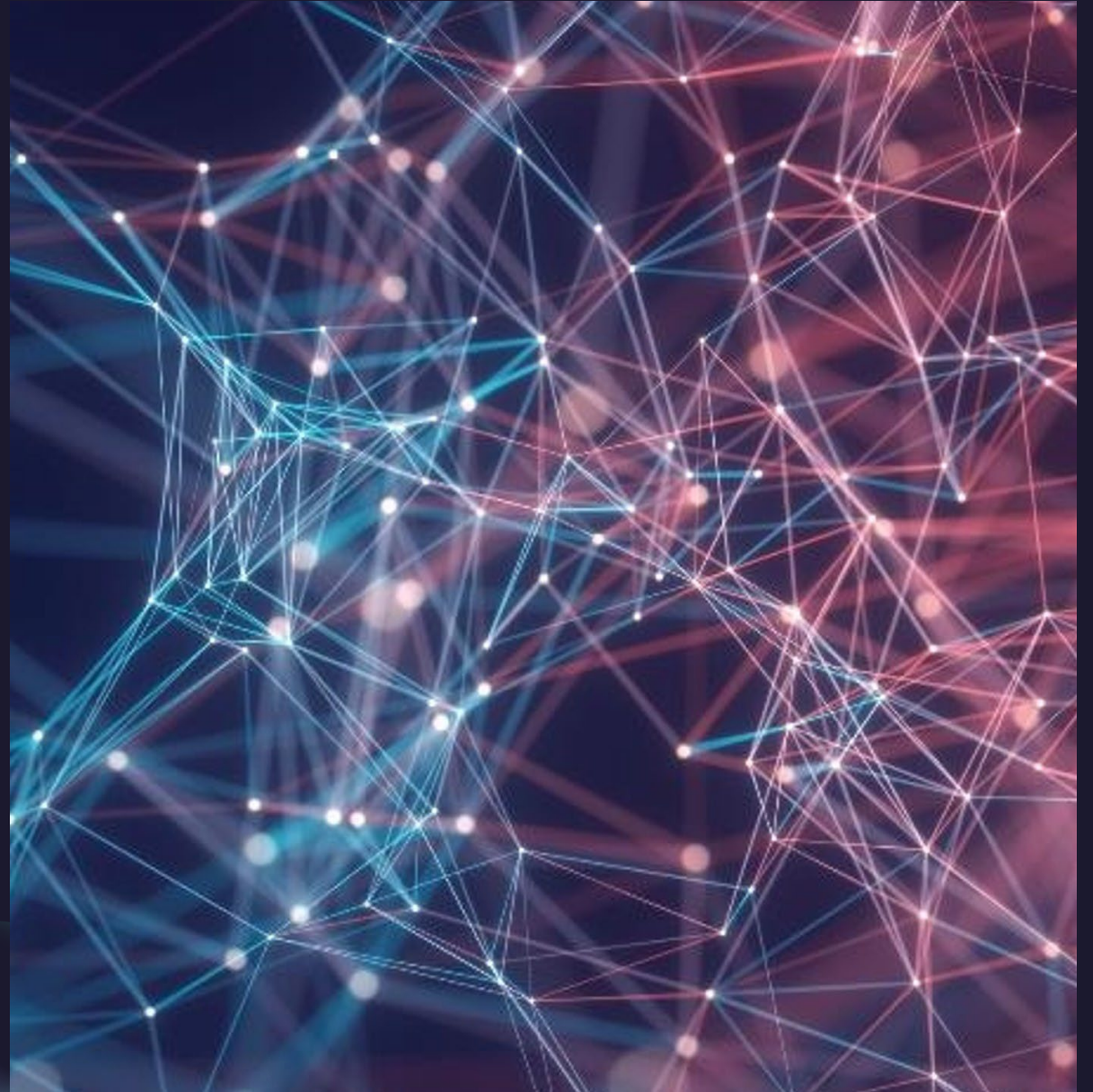
| Type     | Data         | Vector Source                |
|----------|--------------|------------------------------|
| Word     | “APEX”       | Word2Vec, GloVe              |
| Sentence | "Nice car"   | BERT, OpenAI embeddings      |
| Image    | A photo      | CLIP, ResNet, OCI Vision     |
| Audio    | Voice clip   | Whisper, Wav2Vec, OCI Speech |
| Product  | Product info | Custom ML models             |



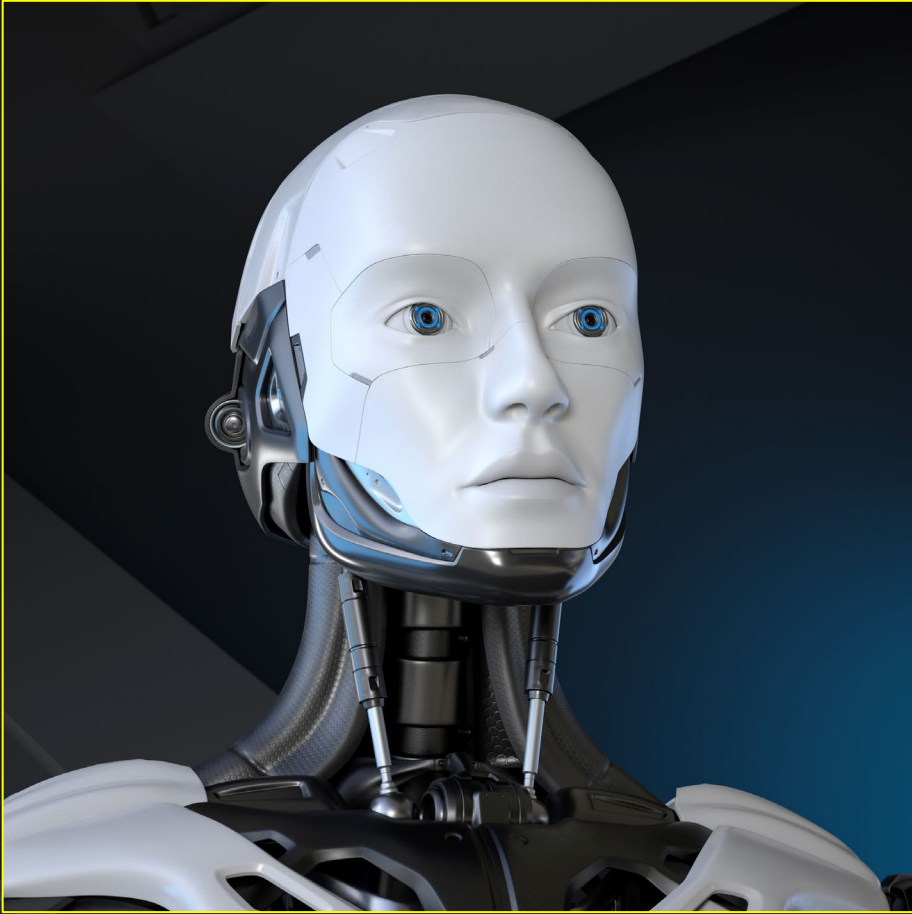
# Vector Dimensions

The “size” of a vector (called **dimensionality**) depends on the model:

- Small (e.g., 50–300 dimensions): Word2Vec
- Medium (e.g., 768): BERT
- Large (e.g., 3072): OpenAI embeddings



# Vector Models



A **vector model** is a machine learning model (or algorithm) that converts unstructured data (like text, images, audio) into **vectors** — numerical representations in a high-dimensional space.

In simple terms:

**A vector model transforms data into a list of numbers that capture its meaning, features, or relationships.**

# Vector Search

**APEX Social Media**

Search  
Dubai

AI Vector Search  
☒

Install App

admin ▾



**AD**

**ADMIN**

6 months ago

This image presents an aerial view of Dubai, showcasing the iconic Burj Al Arab hotel situated on its own man-made island. The structure stands out with its distinctive sail-like design and is surrounded by clear blue waters of the Arabian Gulf. In the foreground, there is a luxury resort complex, featuring beach areas and a marina filled with yachts. Further in the distance, the famous Palm Jumeirah can be seen extending into the sea, with its unique, palm tree-shaped layout and luxury villas lining its fronds. The sky is a soft gradient of blue, complementing the turquoise sea and creating a serene and luxurious coastal atmosphere.

- AI Generated

Vector Distance : 0.40

 0



# APEX Vector Provider

APEX

App Builder

SQL Workshop

Team Development

Gallery

Search

AD

Workspace Utilities

Vector Providers

Vector Provider Details

Edit Page 1

Vector Provider

Cancel

Create

Show All

Identification

Identification

\* Provider Type

- Select -

- Select -

Database ONNX Model

Generative AI Service

Custom PL/SQL

\* Name

\* Static ID

Vector Providers

Vector providers are configured to convert **text** into an **embedding**. The functionality can be covered by an **AI service**, but also locally by an **ONNX model** in the database or a user-defined **PL/SQL function**.

The APEX\_AI public API contains a function for using a Vector Provider to get the embedding for a text.

Vector Providers are stored at the workspace level and therefore are visible in all applications. When you export an application, used Vector Providers are added to the export file. When you import the application into another



# APEX\_AI

```
APEX_AI.GET_VECTOR_EMBEDDINGS (  
    p_value                IN CLOB,  
    p_service_static_id    IN VARCHAR2 )  
RETURN VECTOR;
```

```
APEX_AI.GET_VECTOR_EMBEDDINGS (  
    p_value                IN CLOB,  
    p_local_llm_owner      IN VARCHAR2,  
    p_local_llm_name       IN VARCHAR2 )  
RETURN VECTOR;
```

```
APEX_AI.GET_VECTOR_EMBEDDINGS (  
    p_value                IN CLOB,  
    p_function_name        IN VARCHAR2 )  
RETURN VECTOR;
```

[blogs.oracle.com/apex/post/implement-semantic-search-in-oracle-apex-using-ai-vector-search-of-oracle-database-23ai](https://blogs.oracle.com/apex/post/implement-semantic-search-in-oracle-apex-using-ai-vector-search-of-oracle-database-23ai)



- Pre-built ONNX model
- Hugging Face's all-MiniLM-L12-v2 model is a compact yet powerful sentence transformer model



**SCAN ME**

DEMO !