Generative AI: Foundations

An EDUCATIONAL SERIES on Generative AI

CREOSPAN

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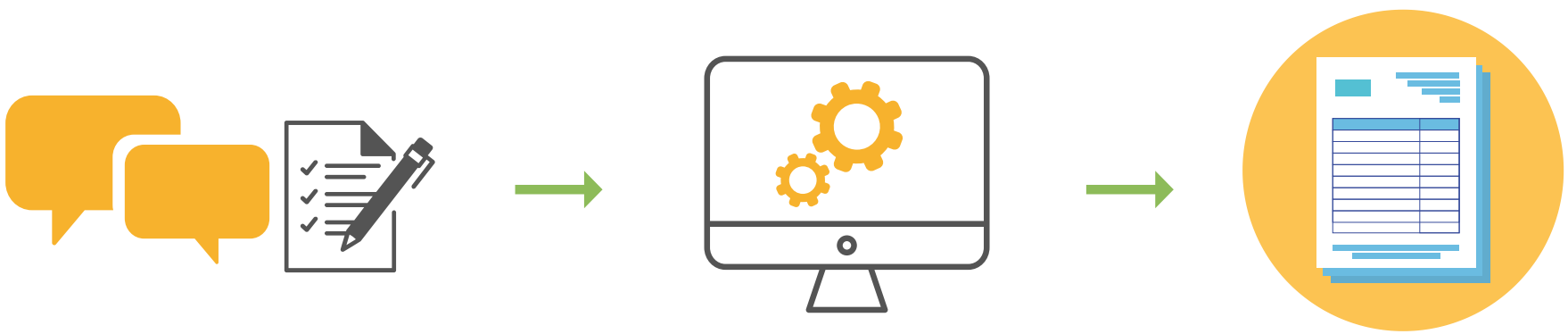
Generative AI:
The Honeybee of the Digital World

Honeybee collects pollen from various flowers, transforming it into nourishing honey.

Flowers → Honeycomb → Honey

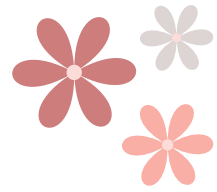
Generative AI gathers data from diverse sources and transforms it into a unique content.



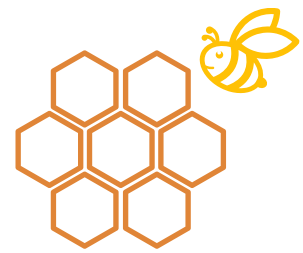
Input → Gen AI Model → Output Content

How does Generative AI work?

- The pollen collected represents the raw data.

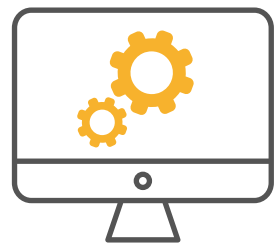


- The hive represents the complex algorithms and neural networks where this data is processed & transformed.



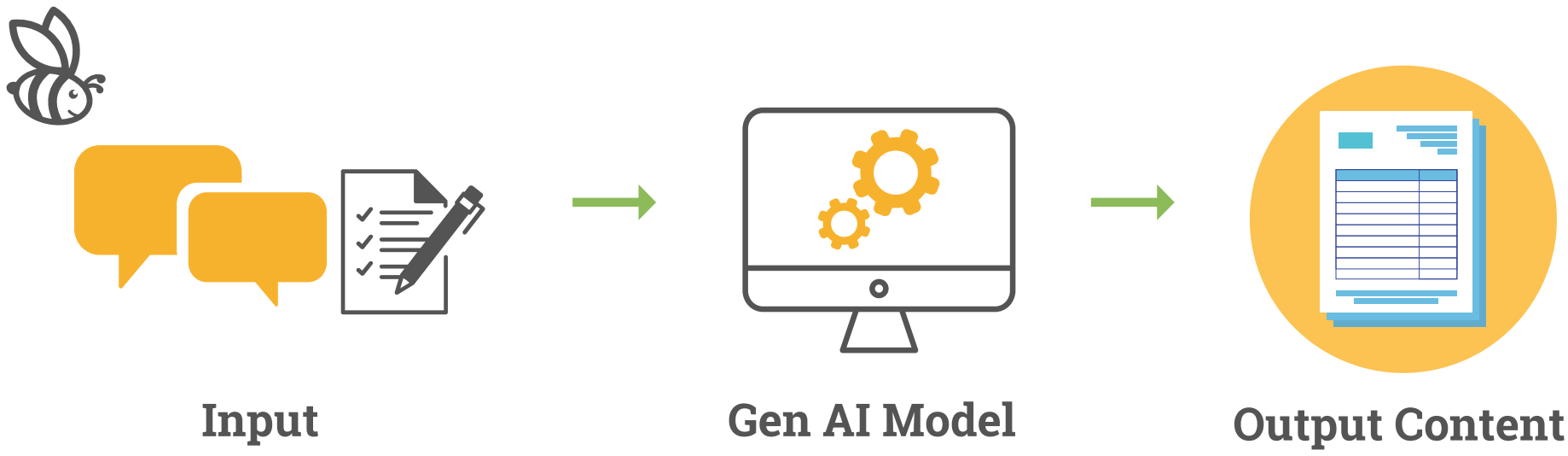
- The honey symbolizes the content, synthesized by Generative AI.

- It's a valuable product that has applications across industries, from healthcare to finance, just as honey serves various purposes in nature.



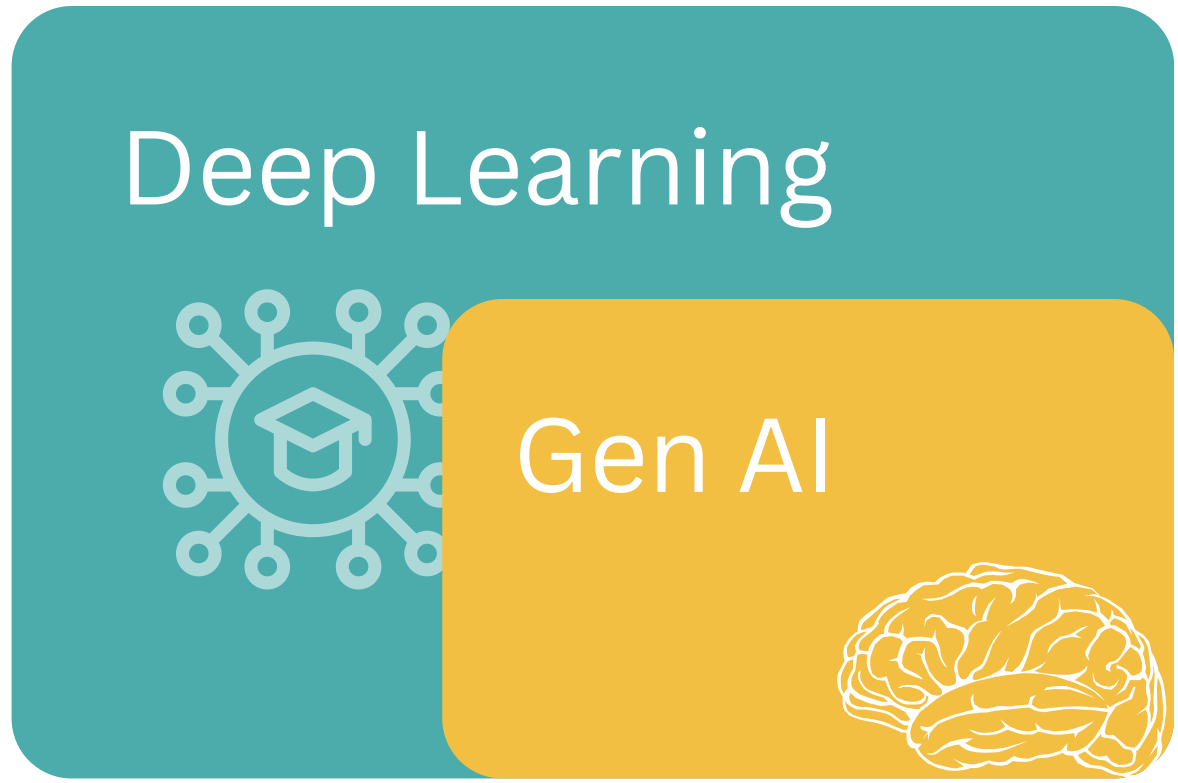
Simplifying
Generative AI

Generative AI, like the industrious honeybee, takes the raw material of our digital world and crafts it into something new, valuable, and uniquely creative.



What is Generative AI?

- Generative AI is a set of algorithms designed to produce unique content, such as text, images, or audio, based on the patterns and characteristics learned from existing content.
- It's a subset of the Deep Learning Model.



What is Deep Learning?

Deep Learning leverages layers of dense neural networks to make decisions.

Types of Deep Learning

Generative Deep Learning

Generate new data samples similar to the input data.

Ex: Creating new images or music.

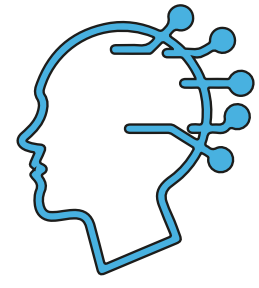
Discriminative Deep Learning

Differentiate between different types of input data.

Ex: Classifying whether an image is of a cat or a dog.

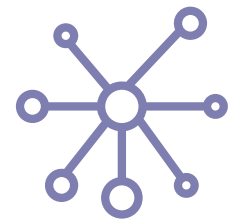
What are Neural Networks?

- A neural network is inspired by the human brain's structure.



- It has interconnected nodes (like neurons) that process information in layers.

- Connections (weights) between nodes adapt to the input data.



- This allows the network to learn, predict, or recognize patterns.

Difference between Gen AI & Non-Gen AI

GEN AI (General AI)

- **Human-like Abilities**: Can understand and learn like humans.
- **Versatile Learning**: Adapts to new tasks without specific programming.

Content Output - Number, Label, Probability.

NON-GEN AI (Narrow AI)

- **Specific Task**: Designed for one function, like Siri's voice recognition.
- **Limited Growth**: Improves only within its set domain.

Content Output - Text, Image, Video.

How does it work?

Leverages Generative Language &
Generative Image Model.

INPUT

Generative image models are trained with images, while generative language models are trained on extensive text datasets.

MODEL

Deep Learning Model.
(Layers of Neural Network)

BUILD GANs

A Generative Adversarial Network (GAN) is a deep learning model where 2 neural networks compete against each other to improve prediction accuracy.

BUILD LLMs

LLMs (Language Learning Models) use transformers, a type of neural network optimized for sequential data, ideal for language tasks.

OUTPUT

Unique Content: Text (LLM),
Image/Video (GAN).

Gen AI Simple Example

At a very basic level, let's say we were to construct a sentence:

- During summer, I like to spend more time on the.....
- It computes the probability of the next word by reviewing the existing content and adding that word.

- In this case, based on the data, the answer could be "Beach."

Large Language Models (LLMs)

- Gen AI models that produce text are also known as LLMs. They provide general NLP capabilities and are trained on massive datasets.

- Natural Language Processing (NLP) enables machines to understand, process, and respond to text or voice data.

- LLMs can perform tasks like translation, summarization, question answering, and more.

Example of Large Language Models (LLMs)

- Google BARD, OpenAI's ChatGPT.

- They utilize deep learning techniques to understand patterns, grammar, and context within a language.

- By doing so, they can generate new text that aligns with the style and content of the training data.

Use cases of Gen AI in Business

Using Gen AI in Telecom

Network Optimization
Customer Engagement
Language Translation for Support

Using Gen AI in Banking

Personalized Financial Education
Fraud Detection
Customer Service Automation
Investment Analysis

Using Gen AI in Healthcare

Personalized Wellness Plans
Therapeutic Conversational Agents
Medical Imaging
Patient Care Automation
Drug Discovery

Using Gen AI in Insurance

Disaster Impact Prediction
Virtual Insurance Advisors
Sentiment Analysis for Claims

Guidelines for building an LLM App

Here are the steps you can follow:

LOAD DOCUMENTS

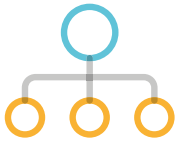
Use tools like LangChain to efficiently load and process documents.

TEXT CHUNKING

Divide documents into manageable text chunks for embedding.

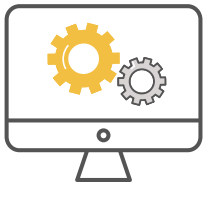
VECTOR STORE CREATION

Set up a vector store, which is essential for storing and retrieving embeddings, facilitating efficient LLM interactions.



EMBEDDING CREATION

Convert text chunks into numerical representations or embeddings.



LLM SELECTION

Choose the appropriate Large Language Model for the application.

PROMPT TEMPLATE DEFINITION

Define a template for the prompts that will be used to interact with the LLM.

Interested in building your own LLM model?

OPTION 1

Speak with one of our experts.

OPTION 2

Looking for a self-guided journey into LLMs?