



Introduction to Gen AI & Applications in Fashion

May, 2024

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- Core principles
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Hello!

Background and Experience



Hello!

Background and Experience

Fun Facts:

- Spent most of my winters ski racing in the Alps.
- Studied three different types of Engineering because I could not pick one!
- Extremely keen cyclist.
- Have not had a pasty yet.

Experience:

- Started my career working at Ferrari near my hometown.
- Worked at Mercedes F1 for 5+ years after moving to the UK.
- Supported 5+ startups in building their core product before launch.
- Decided to try starting my own company to bring F1-like technology to all businesses.



Lead With Tech

AI Algorithms

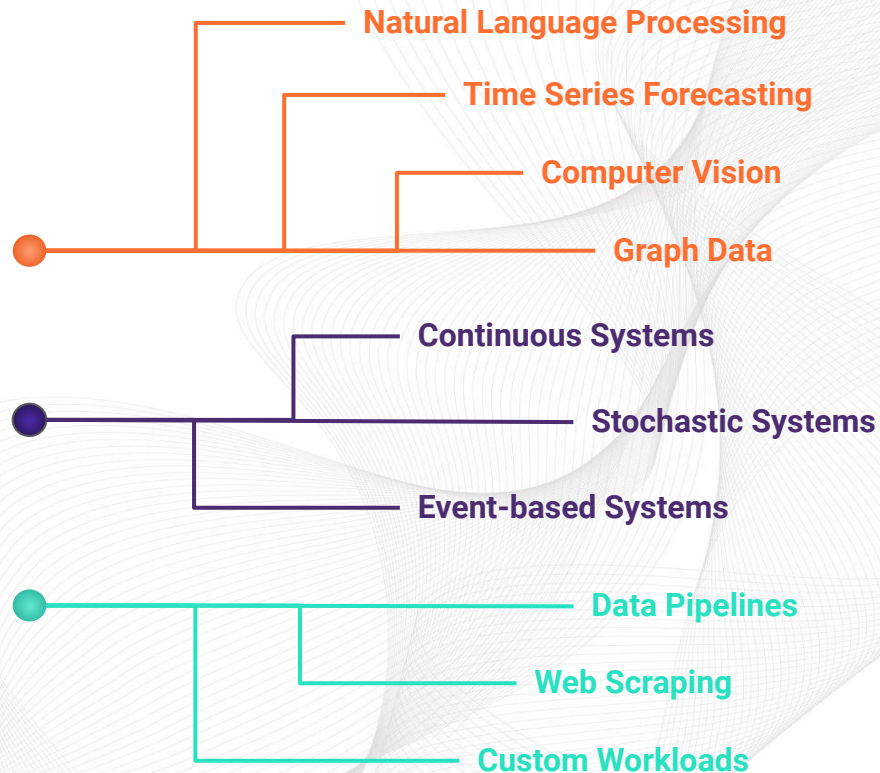
Aim for **better, faster, and cheaper**.

Numerical Simulations

Virtual prototypes improve your results.

Software Automation

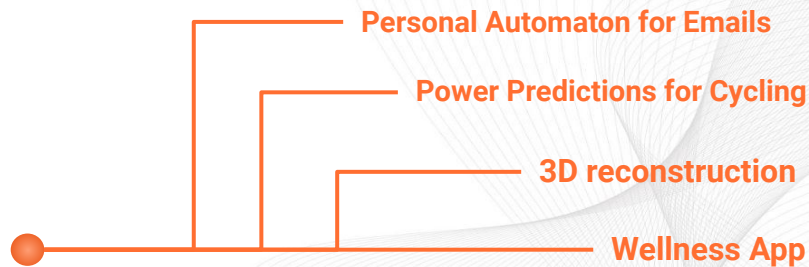
Keep your focus on the important **tasks**.



Lead With Tech

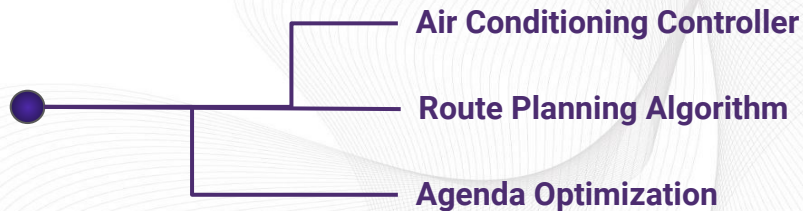
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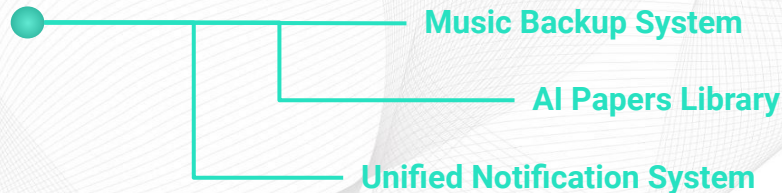
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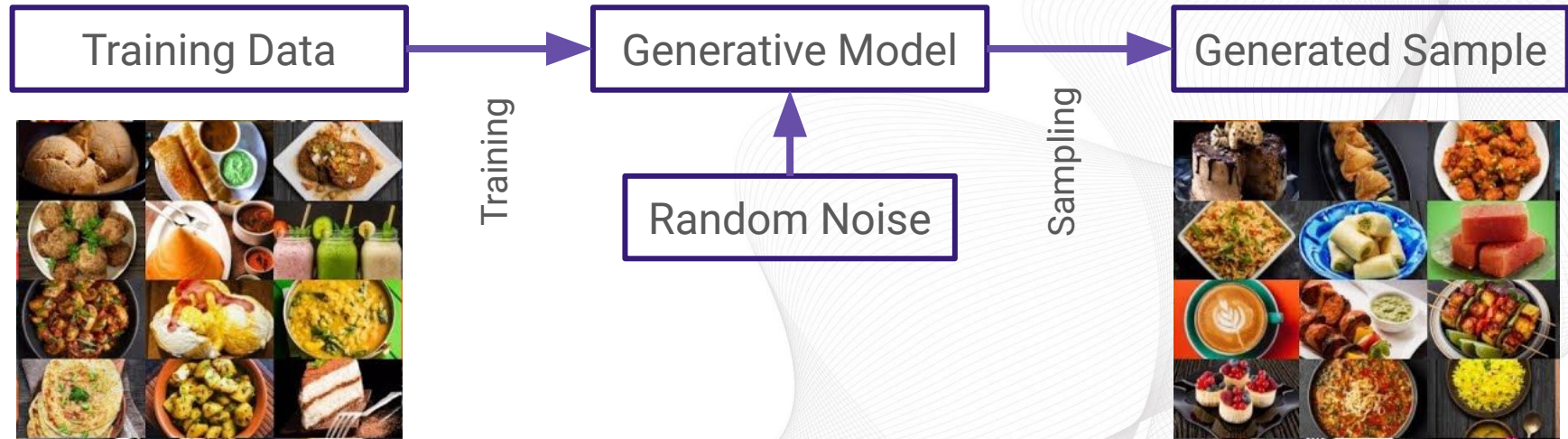
Gen AI

What is it?



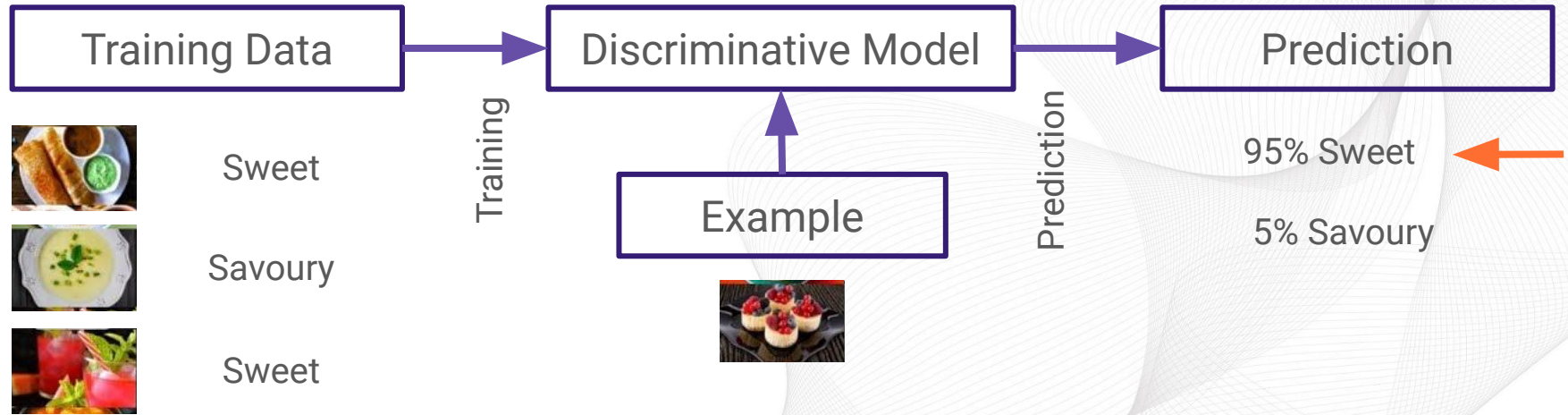
Definition

A generative model is tuned to describe the same dataset that it was generated from. By sampling this model, we generate “synthetic” (new) copies of the data.



Is it different from “regular” AI?

While generative AI produces new data points by learning from previous examples, discriminative AI attempts to assign a value (or category) to an observation.



Core Principles

How does it work?

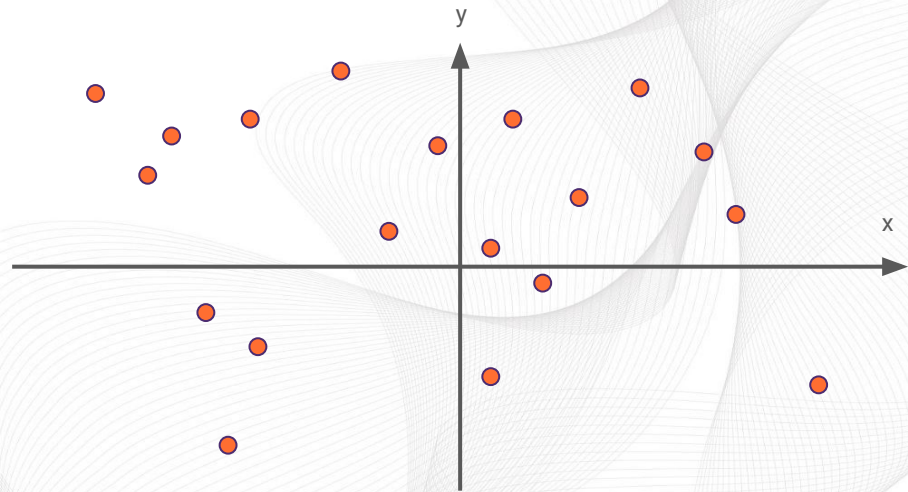


If you were a ML model... (1)

The data points in orange are distributed on the (x,y) plane according to an unknown distribution.

Our task is to come up with good guesses as to where the next points might lie.

Where would you place a new point on this plane?



If you were a ML model... (2)

It turns out that the orange points represents coordinates where we find land rather than water.



Language Models - GPTs

GPTs (General Pre-trained Transformers) are at the base of many GenAI applications: LLama, ChatGPT, Github Copilot, ...

A transformer is a component in a machine learning model that takes as inputs a sequence of tokens and their positions.

Within the transformer, every token is related back to the context around it through a mechanism called “attention”.

As a result of this process, we can formulate good guesses for the next likely token. By iterating this process we obtain a new sequence of tokens as output.

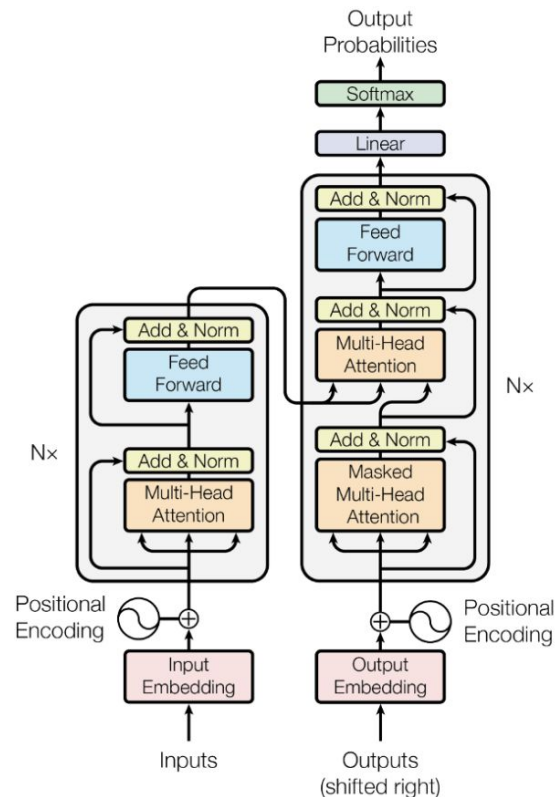


Image from: <https://arxiv.org/pdf/2302.07730>

Image Models - Stable Diffusion

Stable diffusion models are used to create/modify images from a combination of text and images. These models can also be used to complete tasks like

Many image models popular today work by progressively reducing random noise in an image until the desired output image is achieved.

The input text and image are used as a reference to guide the denoising process towards the desired goal.

These models are trained by adding and removing noise from captioned images until the results become acceptable.

Within the component that performs the critical denoising operation we have also have transformers!

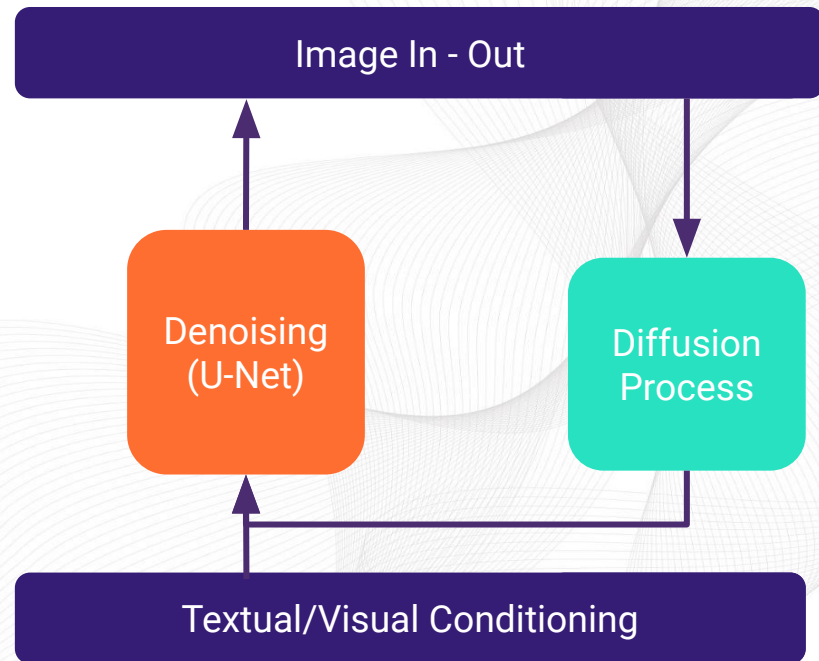
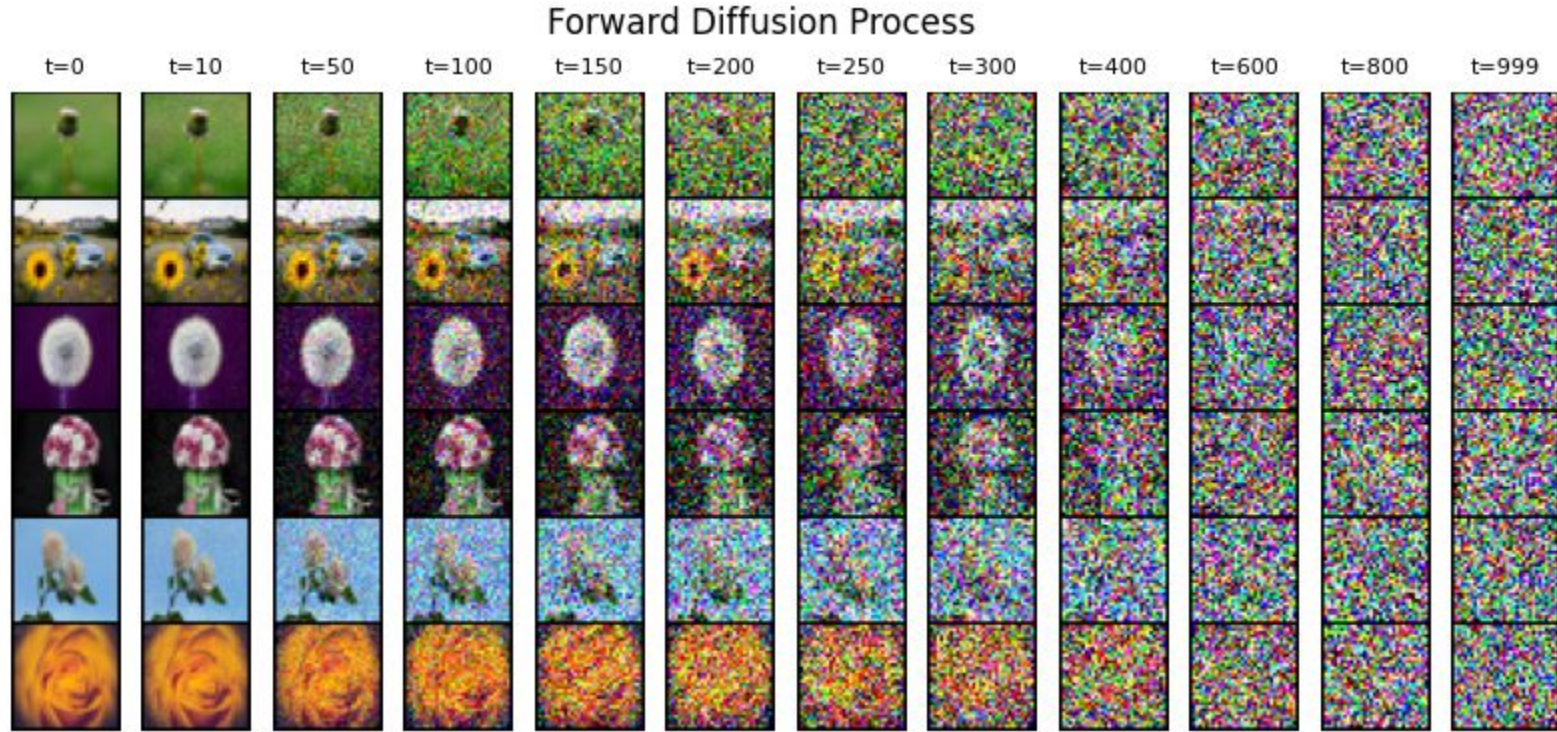


Image Models - Stable Diffusion



Datasets

Common Crawl

Large collections of web pages saved periodically. Great source of data for language models.

LAION (Large-scale Artificial Intelligence Open Network)

Important collections of image-text pairs. The largest collection has 5B images coming from many popular websites

EleutherAI

Important collection of text data from several sources (including a Enron Emails!) used to train many open source alternatives of OpenAI GPTs.

Attention:

All these data sources are freely available but not “immediately” useful. These datasets can contain biased data, problematic text and images, or not be relevant to your intended application.

Potential and Limitations

What are the trade-offs?



The “Good”

Gen AI promises to deliver incredible productivity improvements by:

- Leveraging previously produced artifacts.
- Enhancing the creative process.
- Discover unexpected ideas.
- Reducing labour cost by automating processes.
 - *Around 25% of jobs in arts and design could disappear according to aggressive estimates from [Goldman Sachs](#).*
- Leaving opportunities for people to upskill.



The “Bad”

Unexpected outputs:

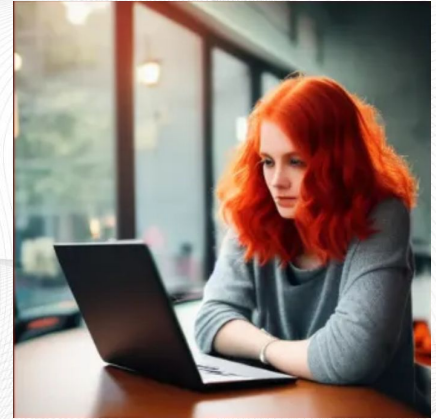
- Hallucinations: An answer is always returned even when the model lacks the capacity to produce a good result. This can happen for many reasons: not enough data, the original data is misleading, ...
- There are many techniques to “hack” Gen AI models to return potentially harmful content or sensitive data.

Public reactions:

- Several companies that released gen AI solutions in the open have faced serious backlash:
 - DPD customer service chatbot going rogue.
 - Levi’s attempt at creating a diverse range of models

Ethical challenges:

- Replication of bias in the training data.
- Good models need large amounts of data. Where is this data coming from?



Applications in Fashion

What is out there now?



New Design Ideas

Use cases:

- Acceleration of sketching
- Generation of new candidate items for existing collections
- Quick production of a large numbers of assets to draw inspiration from

Attention:

- Expect to do plenty of manual edits
- Having large amounts of curated data can enhance the results
- Not all AI designs can be made without modifications
- Quality of results might vary depending on the product category
- Risk of unknowingly replicating existing designs



Visual Content for Marketing

Use cases:

- Image generation for online campaigns and display
- Creation of assets for social media
- Generation of assets for eCommerce sites.

Attention:

- Creation of short videos might become possible soon.
- Expecting to have to carry out plenty of post-processing operations is a must.
- Filters for NSFW content are a necessity.



Copywriting

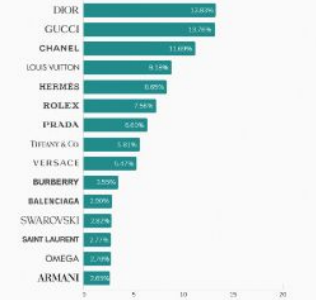
Use cases:

- PR communications
- Investor Relationships
- Content for social media accounts
- Product descriptions

Attention:

- Management of social media accounts could be soon a reality
- Expecting to have to carry out plenty of post-processing operations is a must
- Look out for common AI keywords that make text easily identifiable as AI generated

Dior becomes the most popular luxury brand online in 2023, followed by Gucci and Chanel.



Press Release on search trends | Sample search volume from Q1 2023 to Q1 2023
Source: Luxe Digital

Press Release May 23, 2023

New Study by Luxe Digital Reveals Dior is #1 Most Popular Luxury Brand Online in 2023

Dior claims 13.8% of total search interest online, followed by Gucci, Chanel, Louis Vuitton, and Hermès. Armani and Tiffany & Co. decline, Burberry and Saint Laurent rise in 2023.

[Read Press Release >>](#)

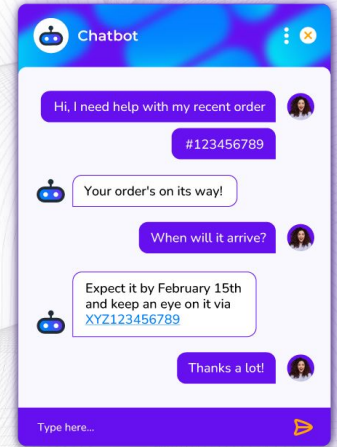
Personalisation

Use cases:

- Improved search experience in eCommerce
- PR communications
- Investor Relationships
- Preparation of content for social media accounts
- Intelligent chatbots

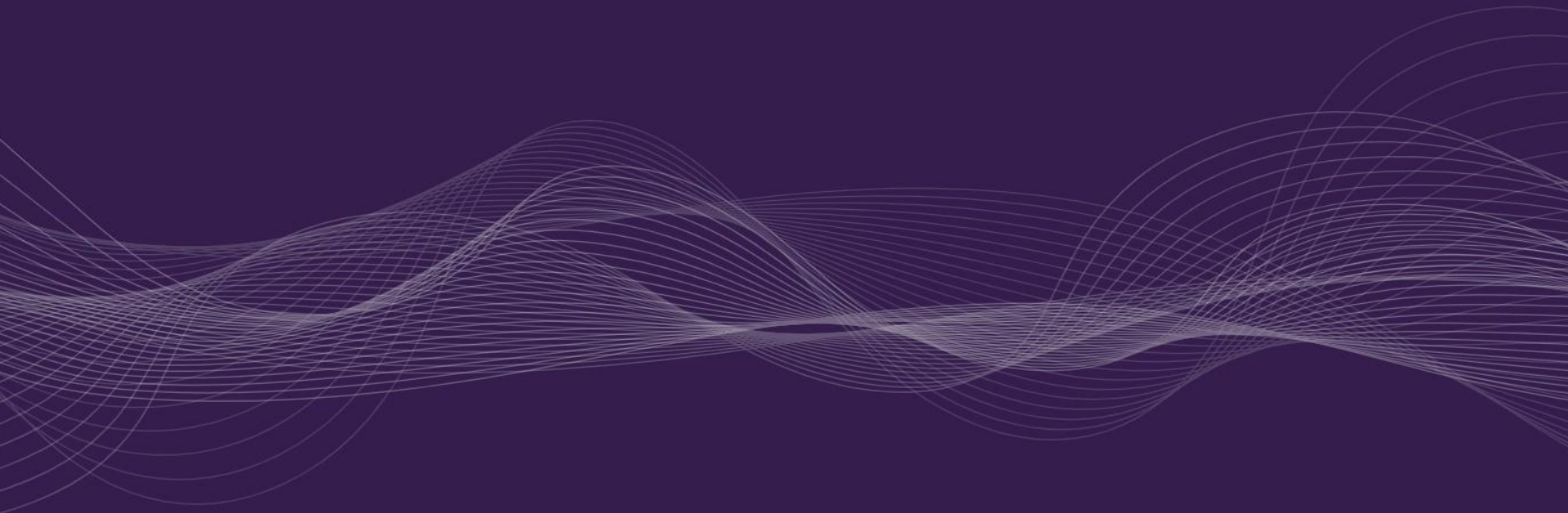
Attention:

- Management of social media accounts might become feasible soon
- Expecting to have to carry out plenty of post-processing operations is a must
- The use of personal data in the models needs to be measured
- Tests of several chatbots shows that they can still fail to surface the right products



Implementation Pillars

Guidelines for Gen AI Projects



Guidelines for Gen AI Projects

1. Start experimenting on the cheap to get firsthand experience.
2. Pick a very narrow and simple use case.
3. Discuss the implication of changes in the current workflow with the
4. You will need more oversight and support from experts than you think. Factor this in!
5. If the output is going to be publicly accessible, add adequate constraints.
6. Perform automated and human testing before release.

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