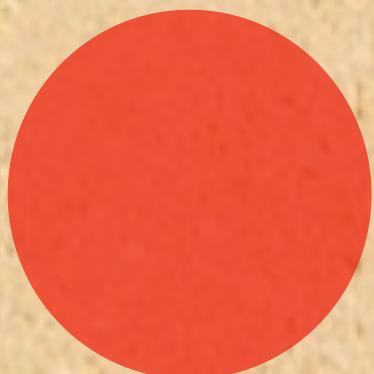


Module 3 - Topic 3

3.3.1 Introduction to Image Models





What's so special about this image?





This AI generated image won a prestigious photography competition.

Picasso or AI?



What are Image Models?

Image models are a subset of Generative AI that create visual content based on data, such as text, images or other visual cues.



An astronaut riding unicorn on Mars

But, it was not always like this!

2022



2024



What has changed?! 🤔

Brief history of Image Models

2006: Restricted Boltzmann Machines

2012: Generative Adversarial Networks

2015: First Diffusion Model

2022: Stable Diffusion (based on Transformers)

2024: 

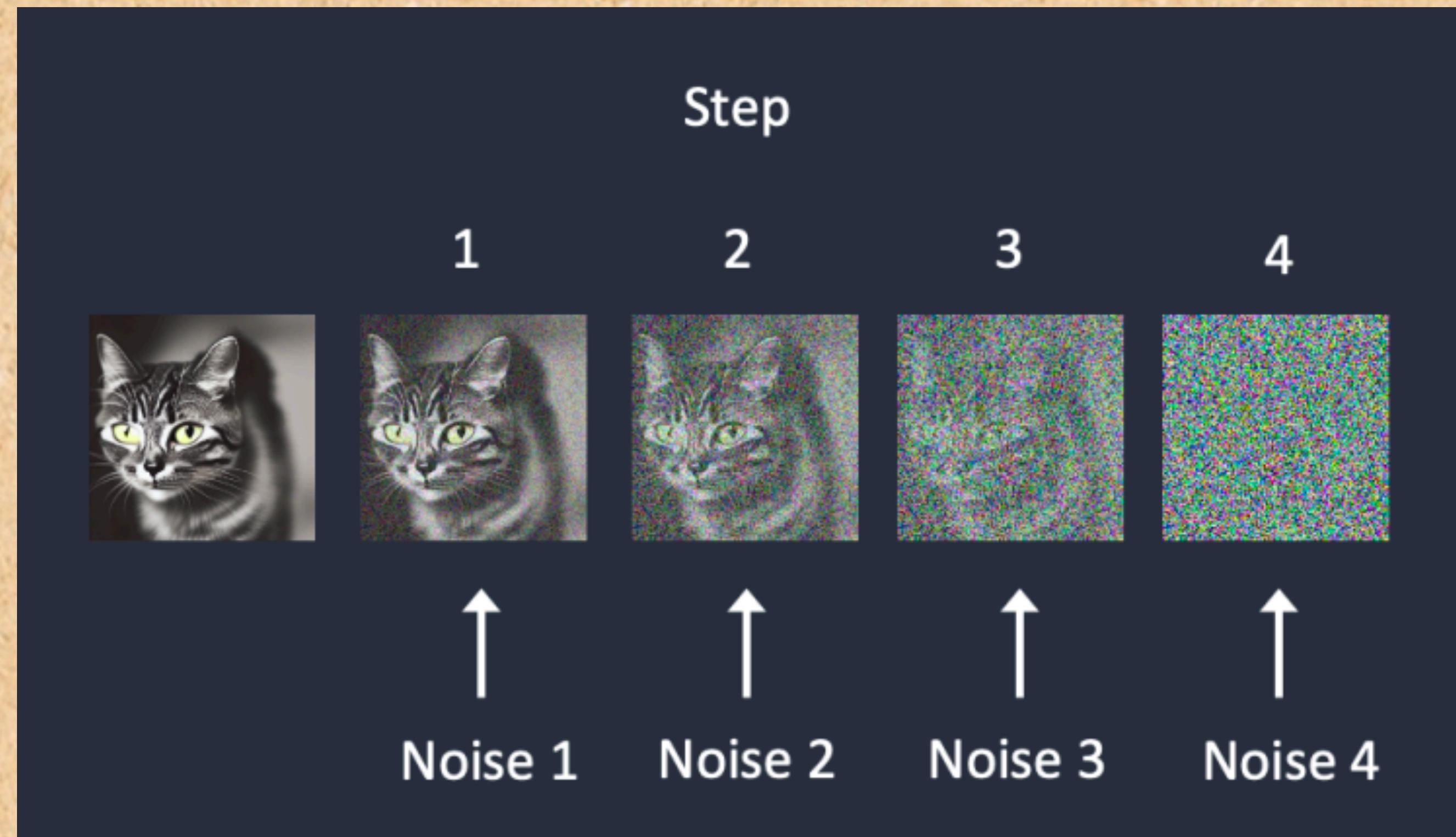
Brief history of Image Models

- **2006:** Restricted Boltzmann Machines (RBMs) were among the earliest models used to learn simple patterns.
- **2012:** Generative Adversarial Networks (GANs) introduced the concept of competition between a generator and discriminator, improving the realism of generated images.
- **2015:** Diffusion models emerged, marking the beginning of a new approach focusing on iterative noise addition and removal to create images.
- **2022:** Stable Diffusion became popular due to its ability to generate high-quality images from text prompts.

Brief Technical Overview

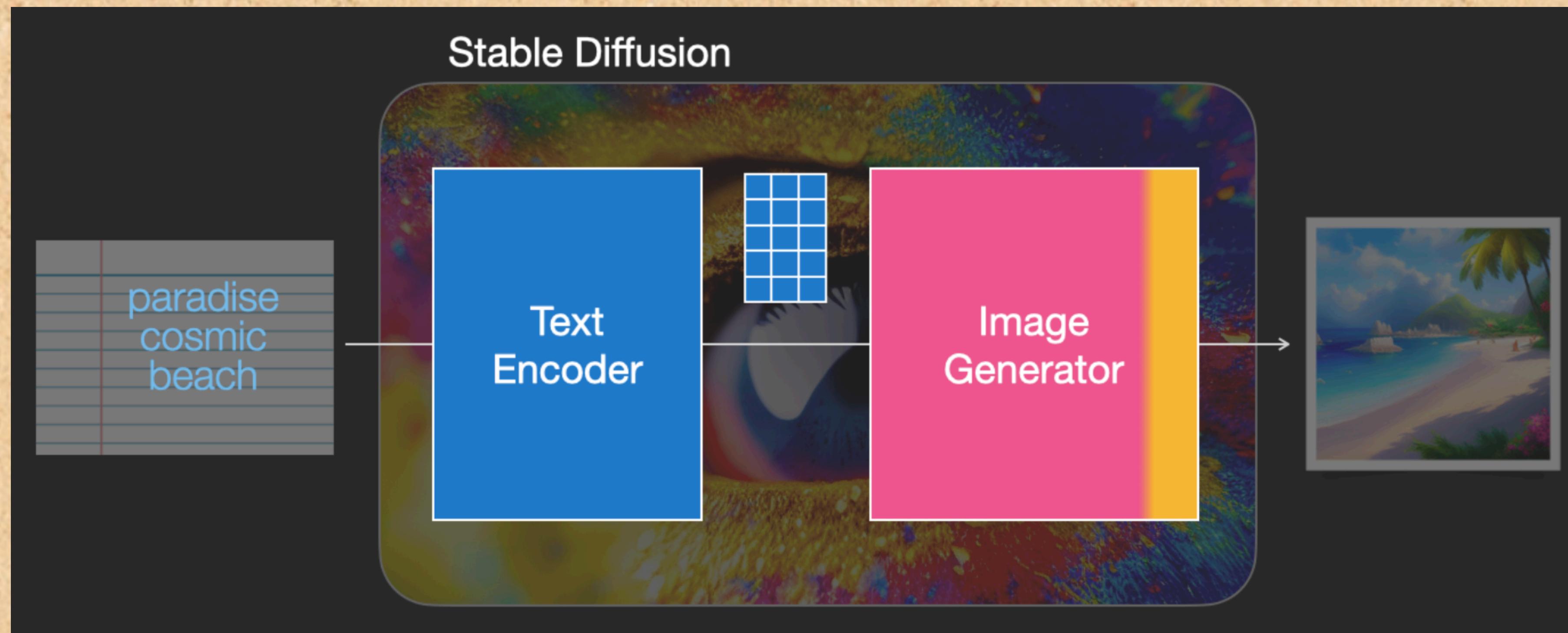
How Image Models learn?

Learns by converting an image to noise and noise to image based on the description



How does it understand text?

Stable Diffusion is not a monolith models - it has multiple components working together



Main Components of Image Model

- **A text embedding model:** This is a model that understands the text and converts it into numbers that can be used by the other models.
- **A denoising model:** This is a model that makes the image from noise by adding or removing some parts of it.
- **A variational autoencoder (VAE):** This is a model that makes the image smaller or bigger by compressing or reconstructing it.

Let's generate images!

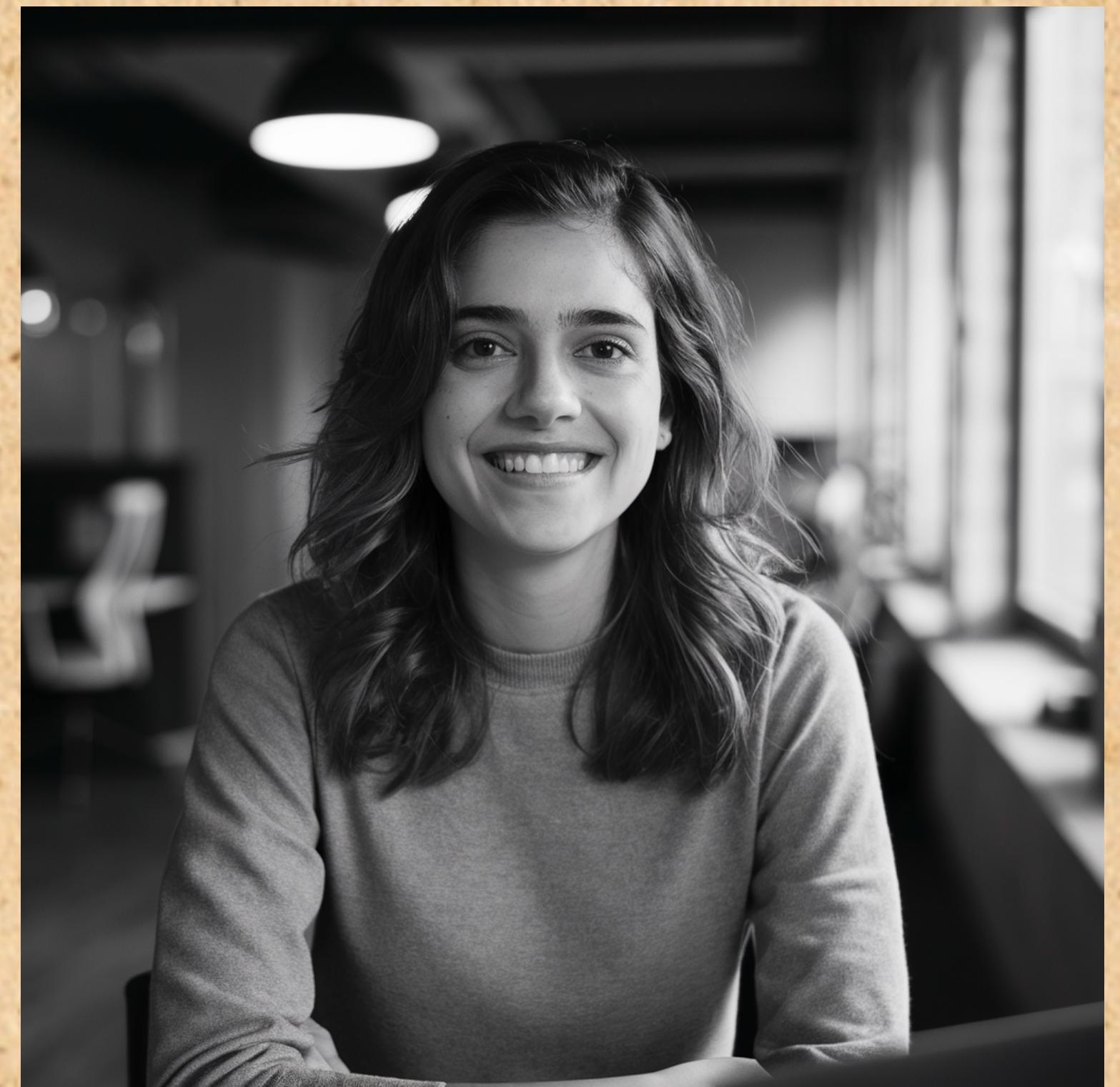


An astronaut riding unicorn on Mars

Few years ago!



2024



Major Players



imagen

