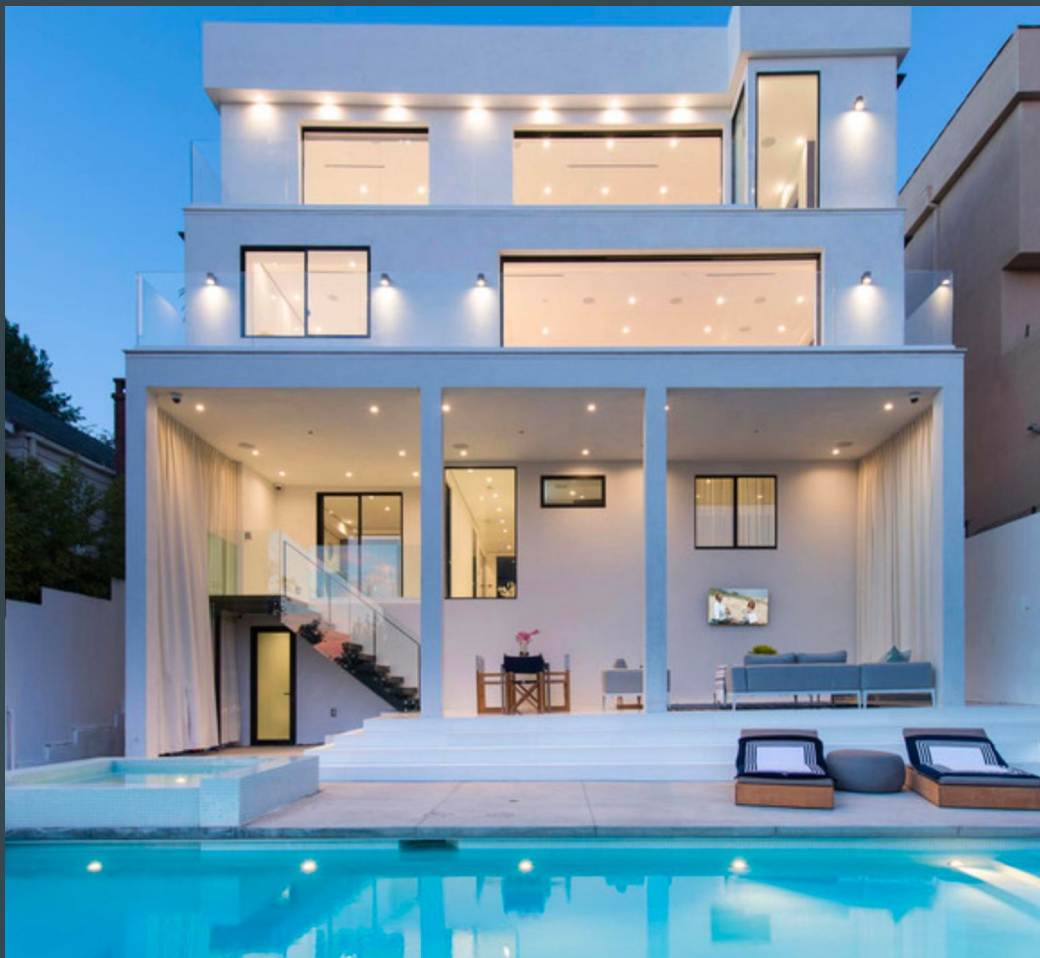




**Andrew, Shrika, Victory, Eddy, Miranda**

# Dream House



**Problem: Lack of architectural originality**

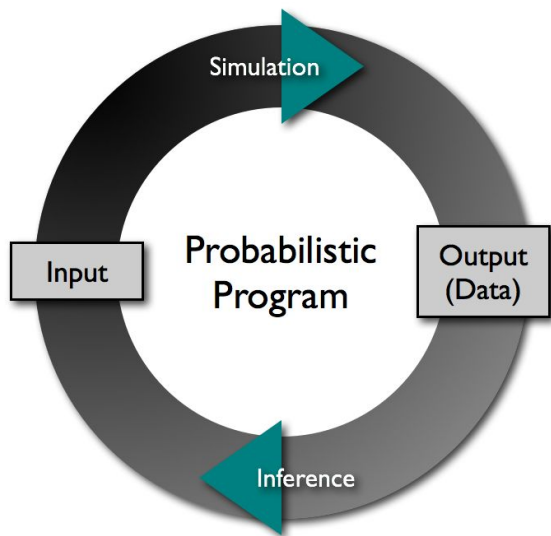
## Our Solution



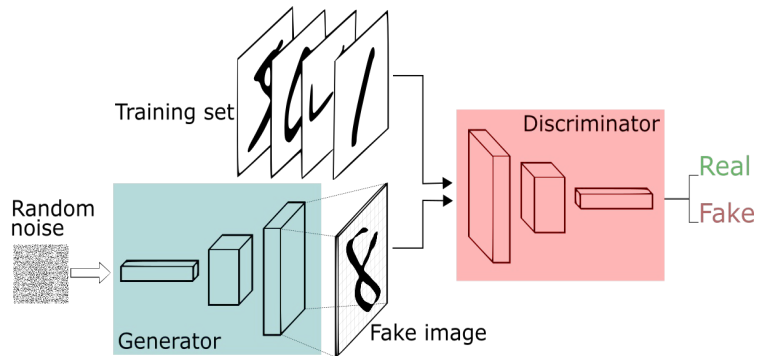
- Ability to specify type and quantity of rooms
- Generate multiple color-coded layouts for the given constraints

# Initial Approaches

## Probabilistic Programming

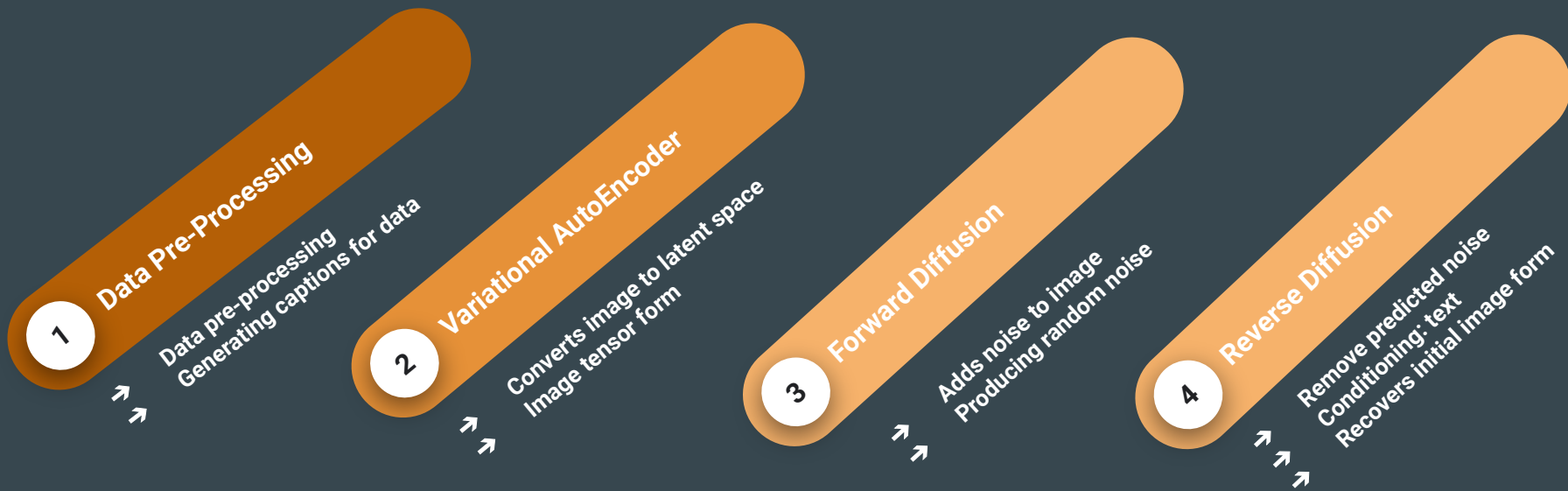


## Generative Adversarial Network



# Our Approach: Stable Diffusion

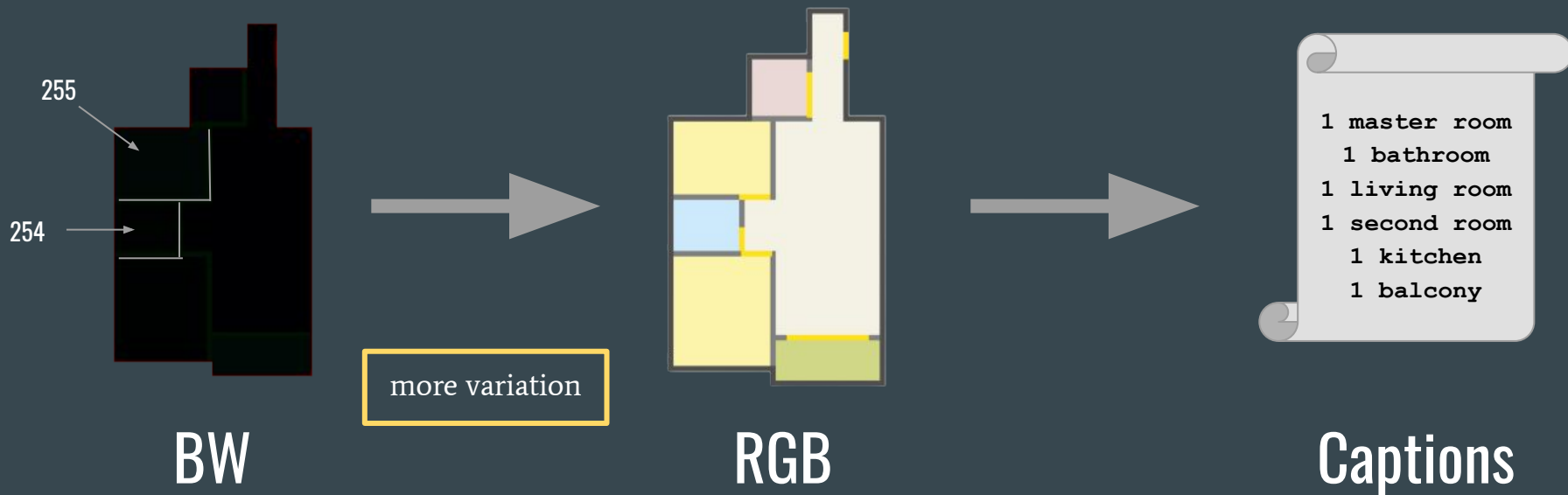
Stable Diffusion is a **text-to-image model**: given text input, output a novel image that matches the semantic meaning of our caption



# Data Pre-Processing

1

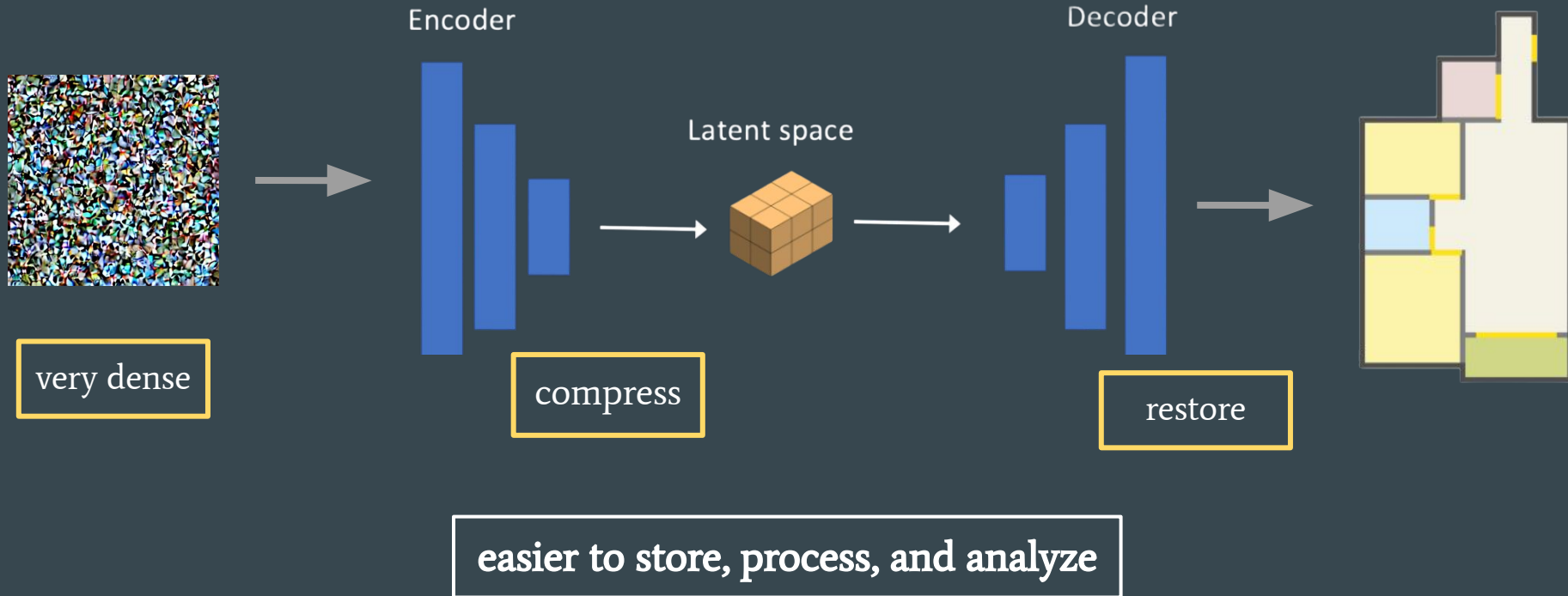
Data Pre-Processing



# Variational Autoencoder

2

Variational Autoencoder





# Forward Diffusion

Cause chaos! Take training data, and add noise!

## Forward diffusion



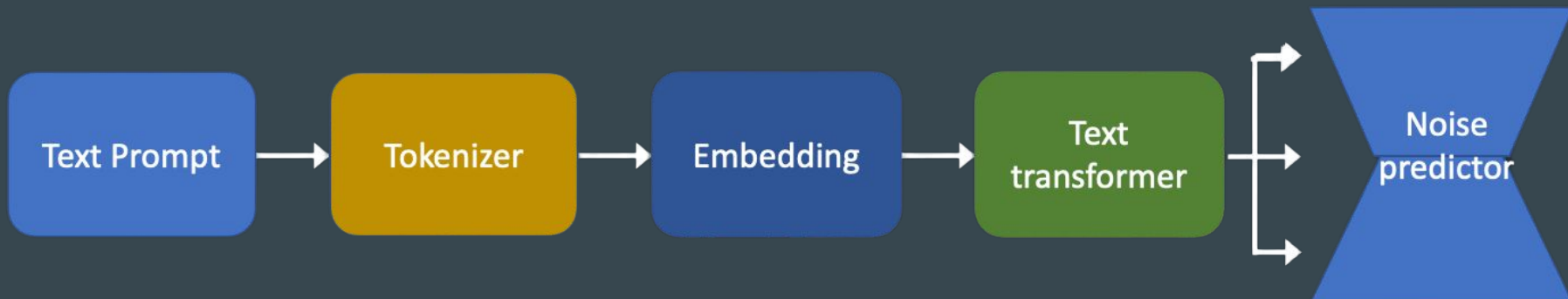
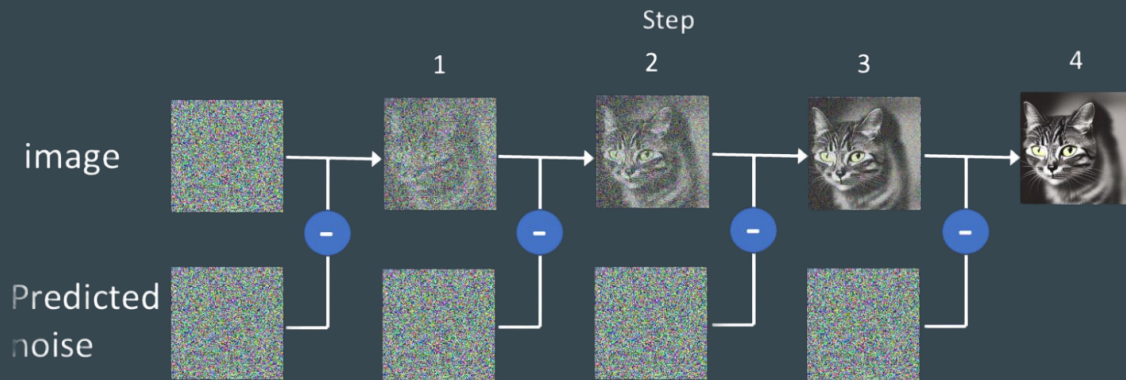
# Reverse Diffusion

How can we learn to identify the noise, and remove it?

4

Reverse Diffusion

Conditioning!



Demo

# Limitations & Future Steps

**Creativity vs accuracy**

**Expand user constraints**

**3D models**

**Direct room labeling**

**Downsampling**

**Text to SVG**

**360°**  
PLAY



**COUCH TO BUNK BEDS!**



Dolls and fashion not included.

**ELEVATOR FOR 4!**



**Barbie**  
DreamHouse

**70+** ACCESSORIES

**FULLY FURNISHED!**

**4+ FT (125+ cm) WIDE**

**3+ FT (120+ cm) TALL**

**8 ROOMS**

**3 STORIES**

**WORKING ELEVATOR FOR 4 DOLLS**

**POOL & SLIDE**

**LIGHTS & SOUNDS**

**TRANSFORMING FURNITURE**

**HOME OFFICE**



WATCH ON  
**NETFLIX**



Dolls not included.



Girl & dog not included.



Requires 4 AAA alkaline batteries, not included.  
© 2023 of trademarks. Colors and decorations may vary.  
Dolls and car sold separately, subject to availability. Some colors may differ.

**ADULT ASSEMBLY REQUIRED**

**3+**



**WARNING:**

**CHOKING HAZARD - Small parts. Not for children under 3 years.**



# ArchiGen

from text to floor plan