

# Research Progress

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# Overview

- Two Main Parts
- 1 - Research Progress
- 2 - Research Outline

# 1 - Research Progress

- Portrait3D:
  - Text-Guided High-Quality 3D Portrait Generation Using Pyramid Representation and GANs Prior



# Code Reproduction - Instance 1

- Input Text:

upper body photo,  
medieval,  
portrait photo of 25 y.o princess  
in blue dress,  
face, pale skin

- randomly generate images:



# The final generated 3D portrait



# The final generated 3D portrait

## Rotation animation



# Code Reproduction - Instance 2

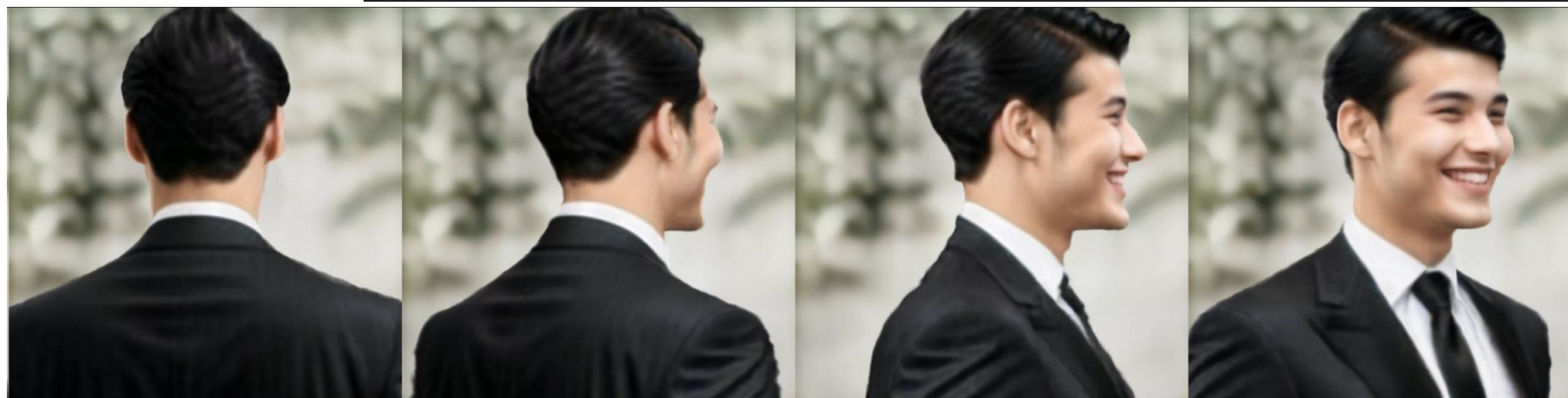
- Input Text:

A smiling man around 25 years old in a formal suit, short black hair

- randomly generate images:



# The final generated 3D portrait



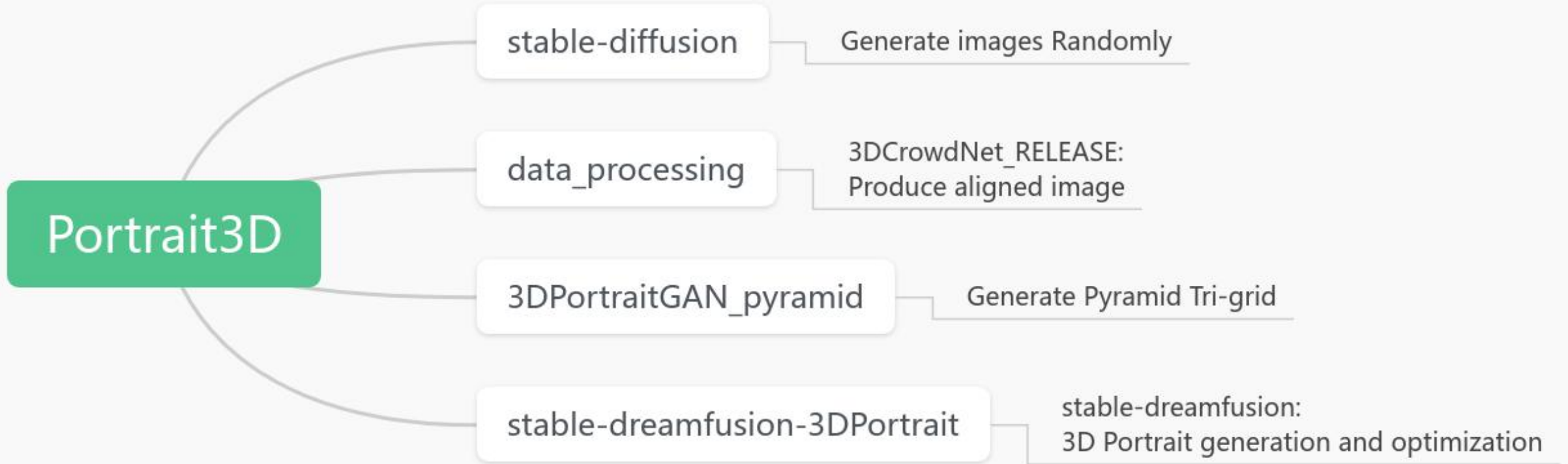


# The final generated 3D portrait

## Rotation animation



# Code Review



# 2 - Research Outline

- 1 - Mathematics Basics
  - Linear algebra, calculus, probability, and statistics...
- 2 - Programming Basics
  - Python...

# 2 - Research Outline

- 3 - Deep Learning Basics
  - neural networks, backpropagation, and loss functions...
- 4 - Convolutional Neural Networks (CNNs)
  - convolution, pooling, and activation functions...
  - Frameworks such as TensorFlow or PyTorch.

# 2 - Research Outline

- 5 - CNN Classic Models
  - LeNet, AlexNet, VGG, GoogLeNet, ResNet...
- 6 - Foundational Models for Avatar Generation and Facial Rigging
  - **GAN**: Generative Adversarial Networks
  - **VAE**: Variational Autoencoders
  - **Diffusion Models**: Such as Stable Diffusion
  - **Transformer**: Such as Vision Transformer(ViT)

# Exploration

- Avatar Generation
- +
- Browser/Server (B/S)
- => ???