Using GAN to Enhance the Resolution of Brain Imaging in Diffusion MRI.

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Motivation

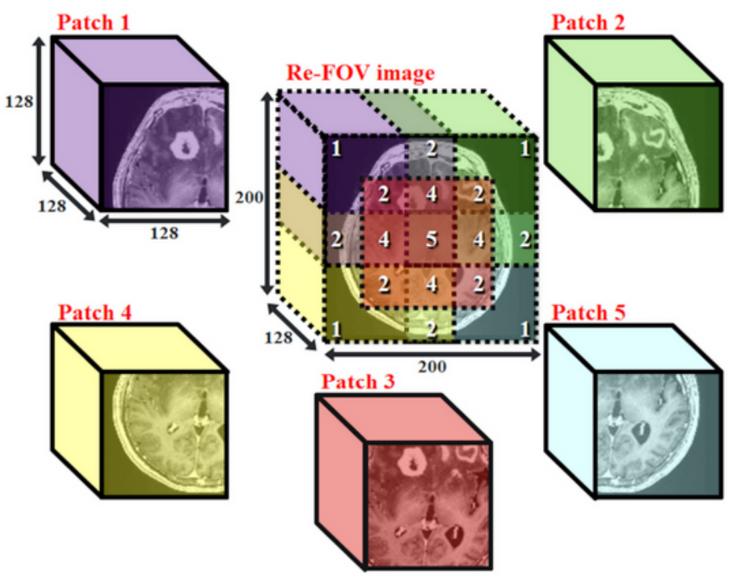
By using the Orientation Distribution Function (ODF) to reconstruct nerve fibers, enhancing the resolution of the images would enable doctors to more clearly observe the crossing, diverging, and converging directions of the nerves.

Introduction

In this project, GAN combined with Unet is utilized to enhance the resolution of brain imaging in Diffusion MRI.
The aim is to develop an efficient GAN model capable of generating more detailed and high-quality brain images.

Process1: Adjusting Images

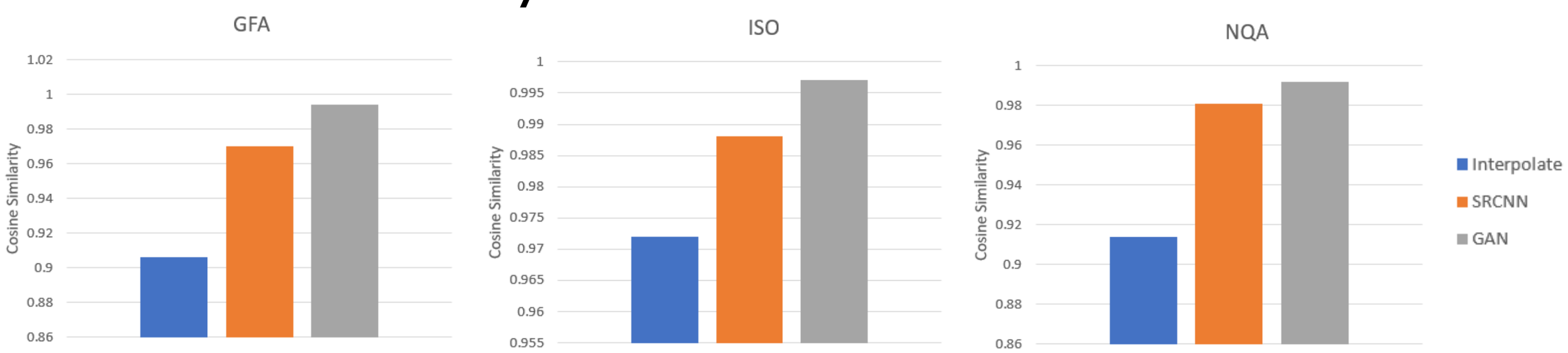
Adjust the images to the required size. High-resolution and low-resolution images will not be the same size, so they need to be adjusted to the same size; and then, the images are divided into five parts.



Process2: Training

The dataset comprises approximately 249 individuals. The weights are saved every 20 iterations, with a training goal of 100,000 iterations.

Process3:Similarity Metric



Process4: Merge Image

After selecting the required model, it will be possible to generate the five pieces of the image separately.
Based on the generated results, these five image segments are then combined.

Result