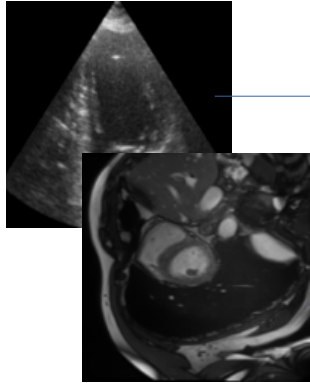


## Phase 1: Pseudo-Label Generation

Input slices  
(US/MRI)

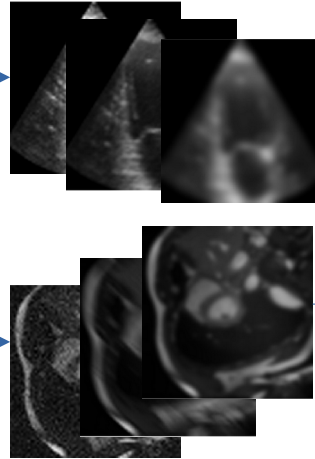


Degradation  
function

Ultrasound  
Speckle Noise

MRI  
Rician Noise

Degraded  
images



Classical  
enhancement

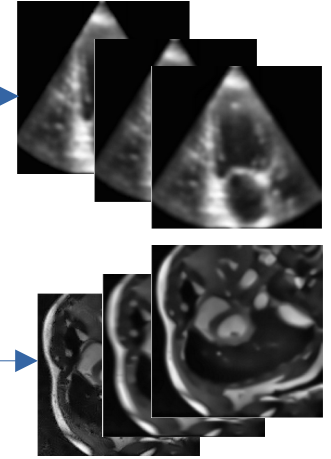
Ultrasound

SRAD  
+  
CLAHE

MRI

N4ITK  
+  
NLM  
+  
CLAHE

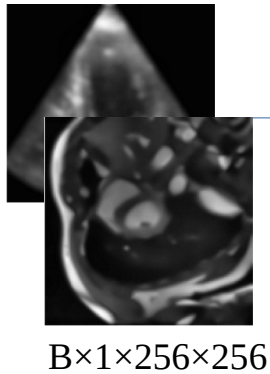
Pseudo  
Labels



## Phase 2: Gradient-guided Diffusion Enhancement

Pre-trained Stable Diffusion (Sampling only)

Pseudo  
Labels

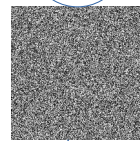


Encoder  
(VAE)

Pseudo  
Label  
Latent

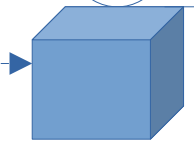
$B \times 4 \times 32 \times 32$

Gaussian  
Noise  
 $x(T)$



Reverse  
Process

Data  
(Target)  
 $x(0)$

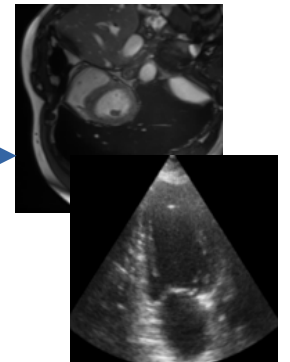


$B \times 4 \times 32 \times 32$

Decoder  
(VAE)

Gradient guidance at each diffusion step

Enhanced  
Images



$B \times 1 \times 256 \times 256$