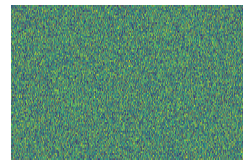
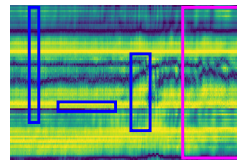
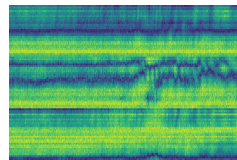
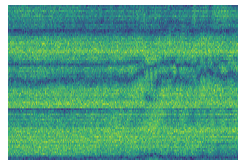


# Adaptive Conditional Diffusion Model (ACDM)



Gaussian Noise



Augmented CSI

$\hat{\mathbf{x}}_T$

$\hat{\mathbf{x}}_t$

$\hat{\mathbf{x}}_{t-1}$

$\hat{\mathbf{x}}_0$

$$q(\hat{\mathbf{x}}_t | \hat{\mathbf{x}}_{t-1})$$

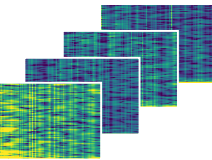
$$p_\theta(\hat{\mathbf{x}}_{t-1} | \hat{\mathbf{x}}_t, \psi(\mathbf{S}, \hat{t}))$$

Adaptive  
Conditioner

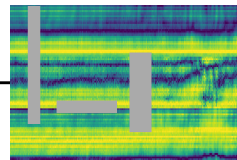
Step Embedding

Step  $t$

$\mathbf{S}$



Spectrogram



Raw CSI

= Missing  
 = Forecast  
 = Imputation

## Ensemble Classifier

CNN-1D

CNN-1D

Concatenate

Transformer  
Encoder

Linear

Softmax

Activity  
Prediction