β-VAE Latent Space Analysis Report

Generated: 2025-08-15 08:46:54

MODEL CONFIGURATION

Input dimension: 558
Latent dimension: 2
Validation samples: 7,500
β parameter: 0.00033995634294115007
Covariance reg: 0.000699999975040555

KL DIVERGENCE METRICS

Mean KL (unweighted): 6.4888
KL std deviation: 1.0388
KL min/max: [3.4319, 15.8592]

RECONSTRUCTION METRICS

MSE: 0.100575
MAE: 0.217236
Combined (0.8*MSE+0.2*MAE): 0.123907

LATENT SPACE STATISTICS

z_mean statistics:

- Mean: [-0.112 0.001]
- Var: [1.098 1.006]

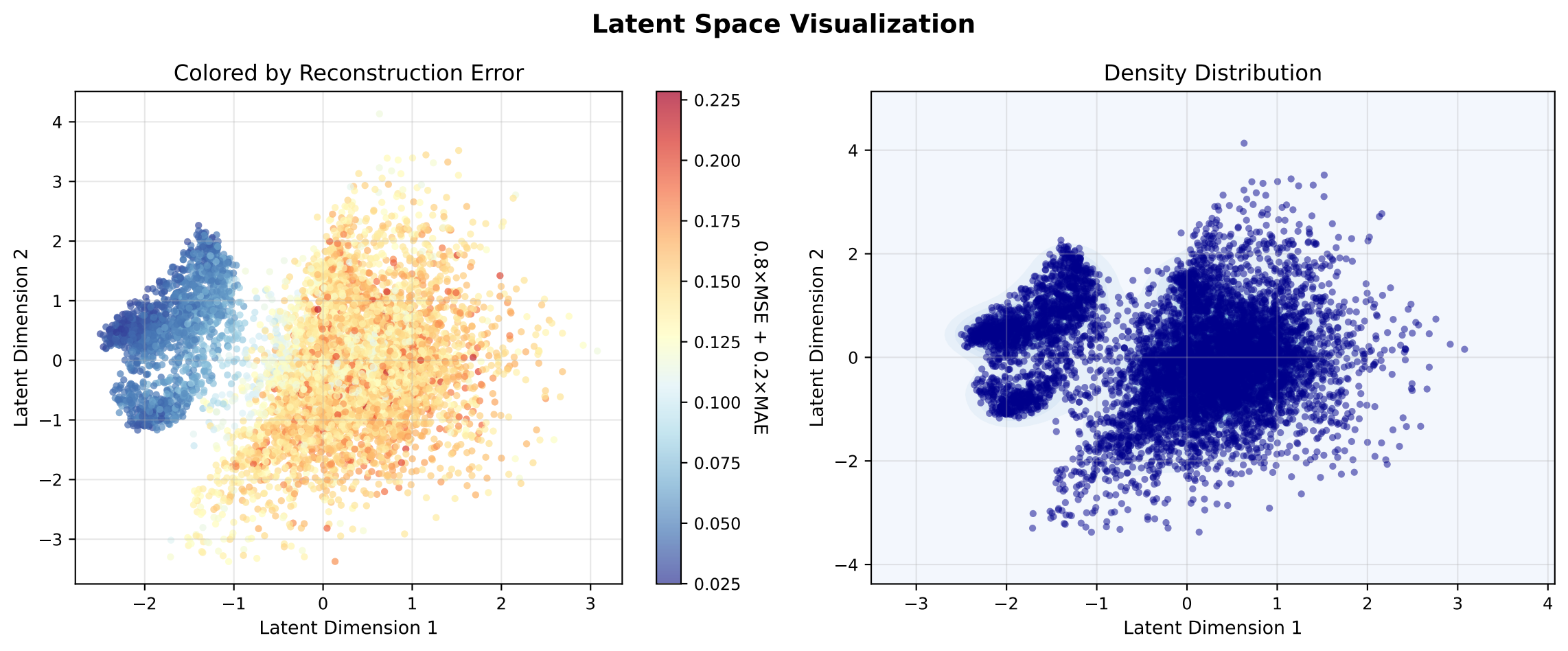
Avg |correlation| off-diagonal: 0.0246

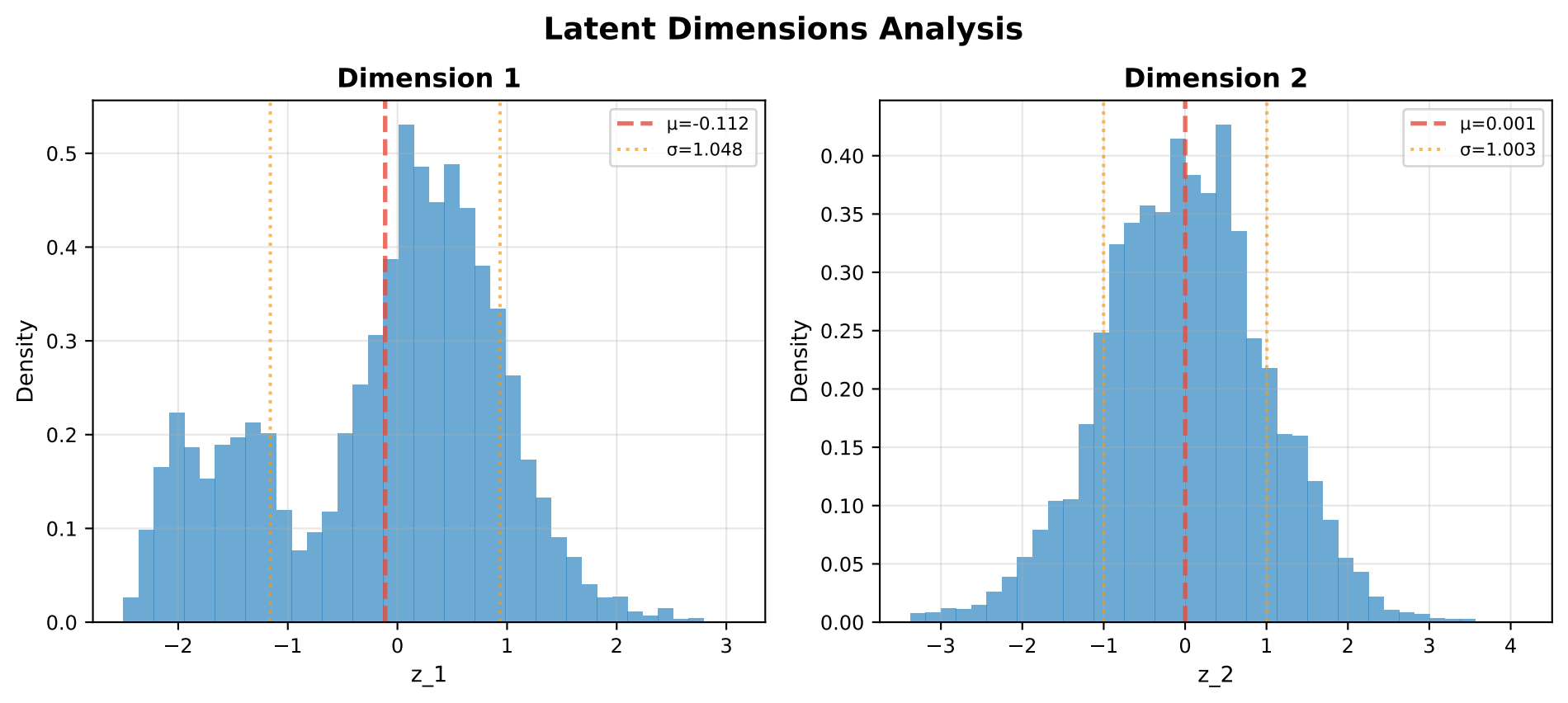
EMBEDDING QUALITY

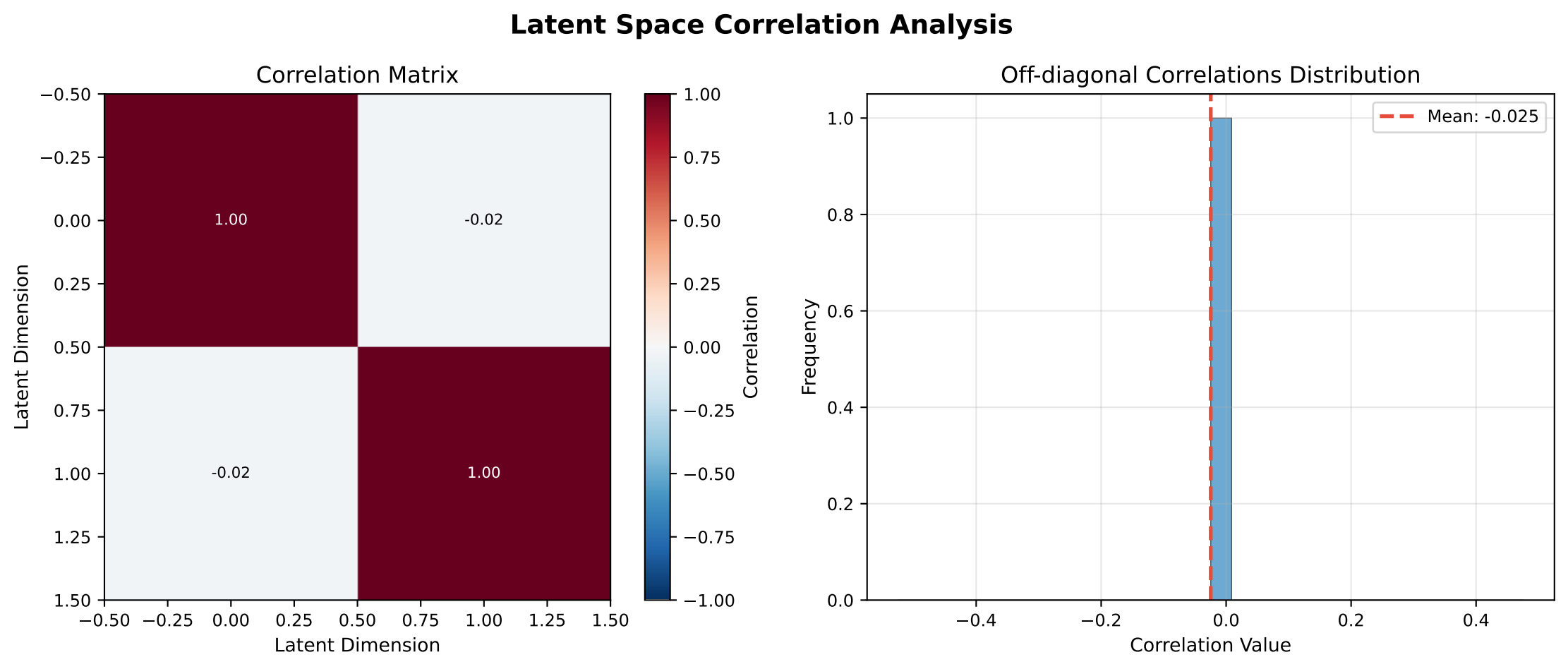
Trustworthiness scores:

- k= 5: 0.8015
- k=10: 0.8013
- k=20: 0.8007

Note: Trustworthiness measures how well the latent space preserves local neighborhood structure from the original space.


Latent Space Visualization
Colored by Reconstruction Error
Density Distribution
Latent Dimension 1
Latent Dimension 2
0.8×MSE + 0.2×MAE
0.225
0.200
0.175
0.150
0.125
0.100
0.075
0.050
0.025


Latent Dimensions Analysis
Dimension 1
μ=-0.112
σ=1.048
Density
z_1
Dimension 2
μ=0.001
σ=1.003
Density
z_2


Latent Space Correlation Analysis
Correlation Matrix
Latent Dimension
Latent Dimension
1.00
-0.02
-0.02
1.00
Correlation
Off-diagonal Correlations Distribution
Mean: -0.025
Frequency
Correlation Value

Performance Metrics Dashboard