CNN Feature Analysis: Grid 12×12

Original Input

One-Hot Embedding
10 channels
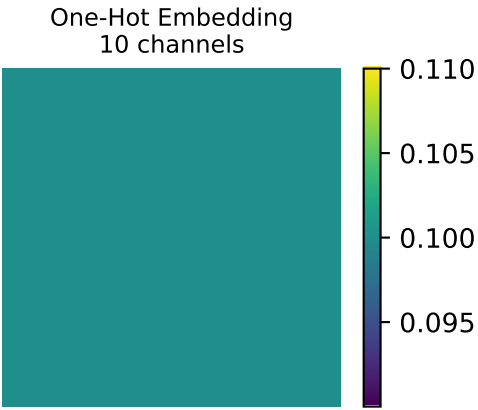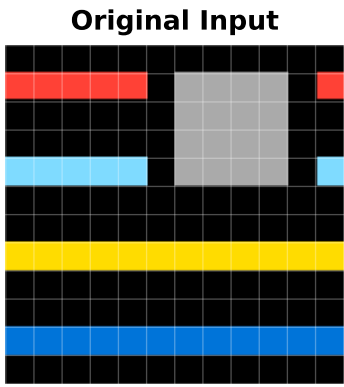
```
Grid Size: 12×12  |  CNN: 3 conv layers  |  Hidden Dim: 128

Layer Statistics:
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EMBED: Ch=10, Size=(12, 12), Mean=0.100±0.184, Range=[0.00,1.00]
    Diversity=0.5621, Sparsity=0.900, Entropy=1.58

CONV1: Ch=32, Size=(12, 12), Mean=0.660±0.235, Range=[0.00,6.49]
    Diversity=0.6891, Sparsity=0.582, Entropy=3.81

CONV2: Ch=32, Size=(12, 12), Mean=0.346±0.187, Range=[0.00,5.18]
    Diversity=0.7447, Sparsity=0.685, Entropy=3.47

CONV3: Ch=32, Size=(12, 12), Mean=0.309±0.191, Range=[0.00,3.13]
    Diversity=0.5908, Sparsity=0.548, Entropy=3.79

SPATIAL_FEATURES: Ch=32, Size=(12, 12), Mean=0.309±0.191, Range=[0.00,3.13]
    Diversity=0.5908, Sparsity=0.548, Entropy=3.79
```
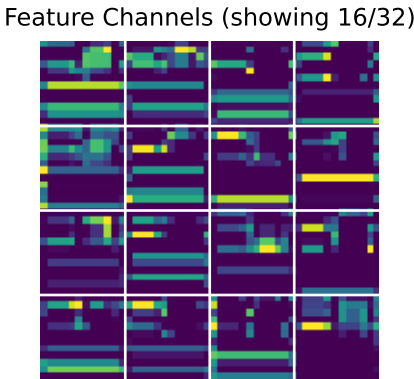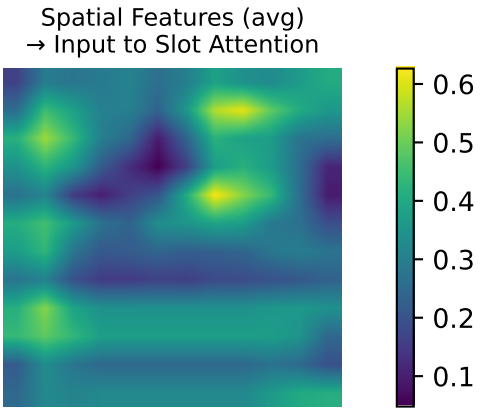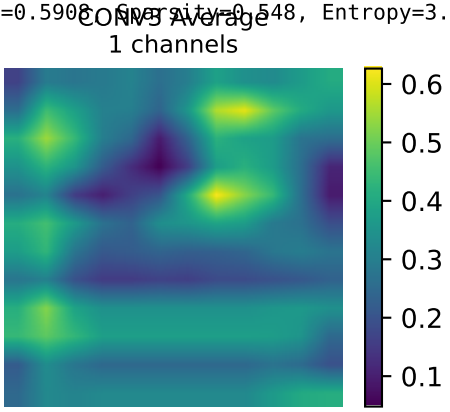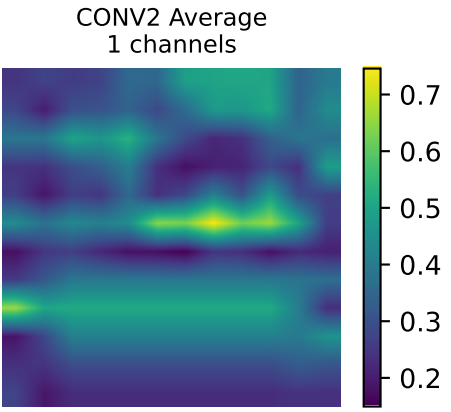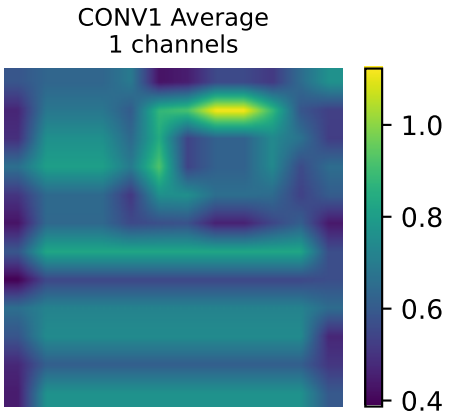
CONV1 Average
1 channels

CONV2 Average
1 channels

CONV3 Average
1 channels

Spatial Features (avg)
→ Input to Slot Attention

Feature Channels (showing 16/32)

Feature Channels (showing 16/32)

Feature Channels (showing 16/32)

Feature Channels (showing 16/32)
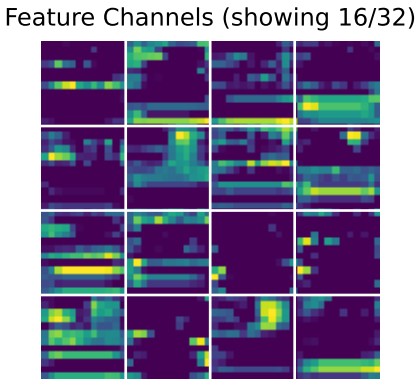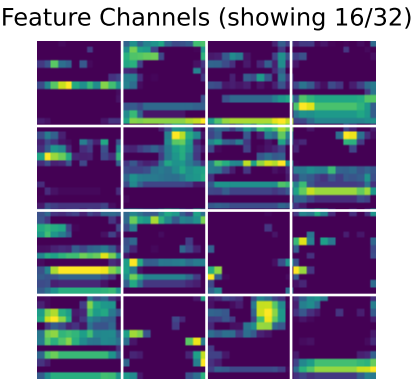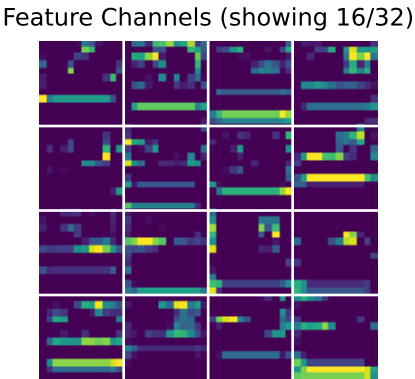
```
DIAGNOSIS SUMMARY:
==================================
  ✓ GOOD DIVERSITY
  ⚠  HIGH SPARSITY: Many dead neurons
  ✓ GOOD ENTROPY
```

Spatial Feature Channel Activations (mean ± std)

Spatial Location Similarity
(sample of 50 locations)