# CNN Feature Analysis: Grid 3×3

**Original Input**



**One-Hot Embedding**
**10 channels**



```
Grid Size: 3×3  |  CNN: 3 conv layers  |  Hidden Dim: 128

Layer Statistics:
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EMBED: Ch=10, Size=(3, 3), Mean=0.100±0.213, Range=[0.00,1.00]
  Diversity=0.4444, Sparsity=0.900, Entropy=0.29

CONV1: Ch=32, Size=(3, 3), Mean=0.578±0.344, Range=[0.00,4.86]
  Diversity=0.6151, Sparsity=0.559, Entropy=1.07

CONV2: Ch=32, Size=(3, 3), Mean=0.273±0.264, Range=[0.00,3.17]
  Diversity=0.5980, Sparsity=0.670, Entropy=0.78

CONV3: Ch=32, Size=(3, 3), Mean=0.510±0.340, Range=[0.00,2.25]
  Diversity=0.1267, Sparsity=0.174, Entropy=1.73

SPATIAL_FEATURES: Ch=32, Size=(3, 3), Mean=0.510±0.340, Range=[0.00,2.25]
  Diversity=0.1267, Sparsity=0.174, Entropy=1.73
```
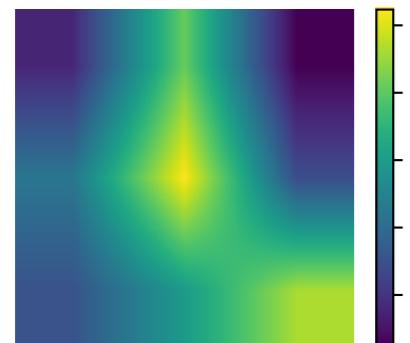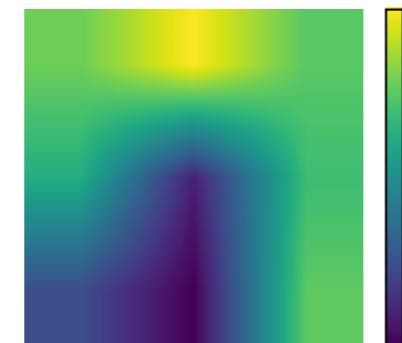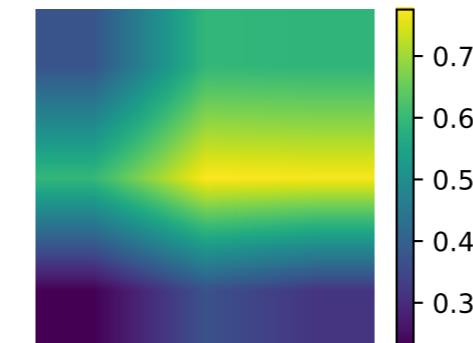
**CONV1 Average**
**1 channels**
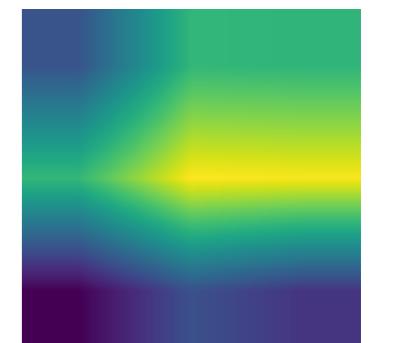


**CONV2 Average**
**1 channels**
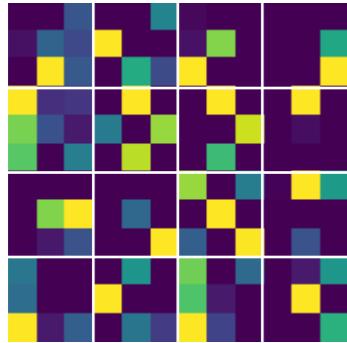


**CONV3 Average**
**1 channels**
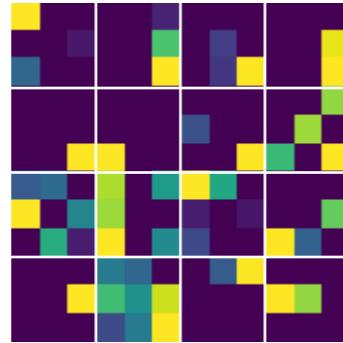


**Spatial Features (avg)**
**→ Input to Slot Attention**
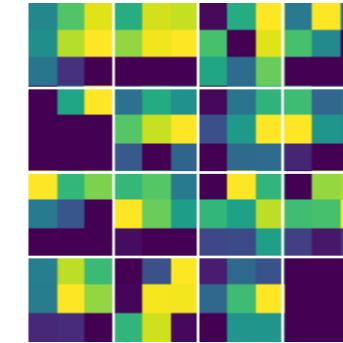


**Feature Channels (showing 16/32)**
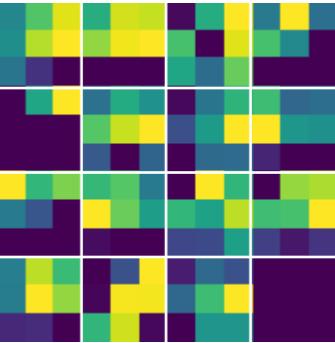


**Feature Channels (showing 16/32)**



**Feature Channels (showing 16/32)**
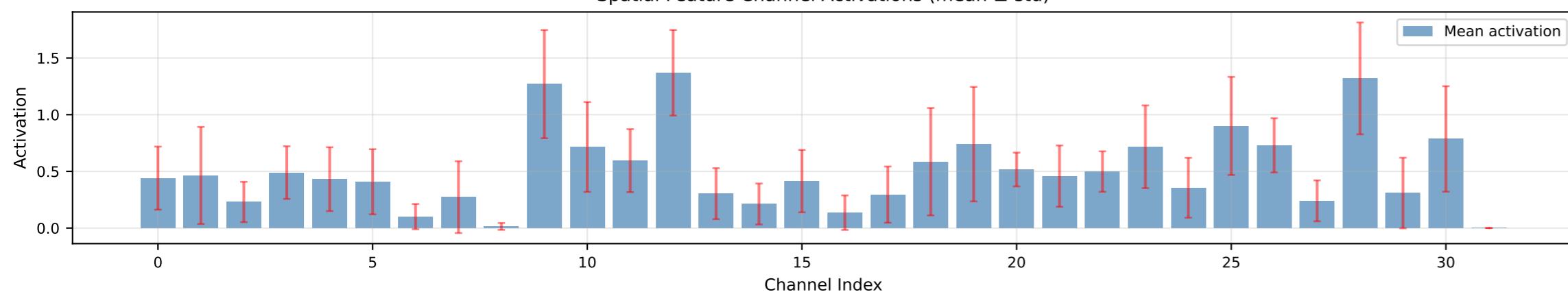


**Feature Channels (showing 16/32)**



```
DIAGNOSIS SUMMARY:
============================================
  GOOD SPARSITY
⚠  LOW ENTROPY: Low information
```

**Spatial Feature Channel Activations (mean ± std)**



**Spatial Location Similarity**
**(sample of 9 locations)**