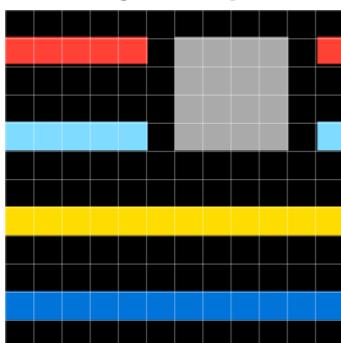
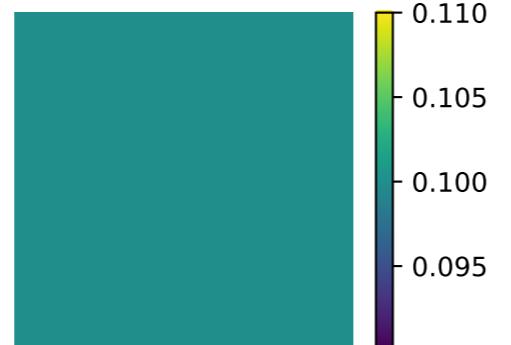


# CNN Feature Analysis: Grid 12×12

**Original Input**



One-Hot Embedding  
10 channels



Grid Size: 12×12 | CNN: 3 conv layers | Hidden Dim: 128

Layer Statistics:

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

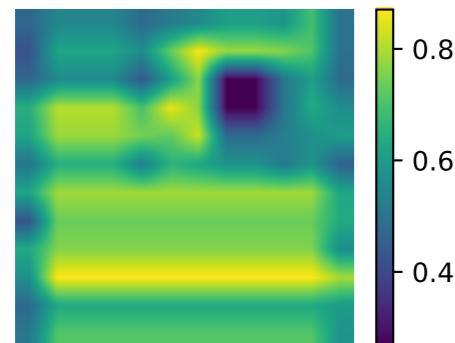
CONV1: Ch=128, Size=(12, 12), Mean=0.660±0.204, Range=[0.00, 7.98]  
Diversity=0.7007, Sparsity=0.578, Entropy=3.84

CONV2: Ch=128, Size=(12, 12), Mean=0.348±0.202, Range=[0.00, 7.88]  
Diversity=0.7985, Sparsity=0.742, Entropy=3.25

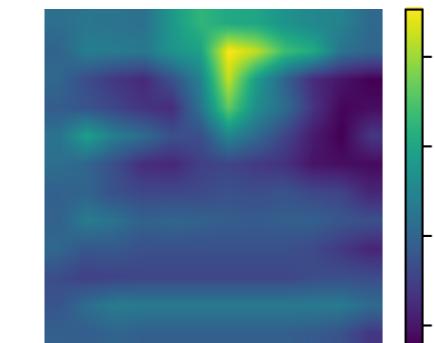
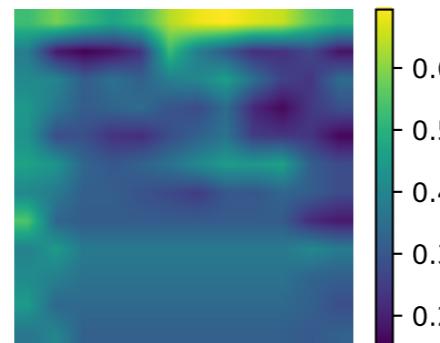
CONV3: Ch=128, Size=(12, 12), Mean=0.386±0.209, Range=[0.00, 7.59]  
Diversity=0.7045, Sparsity=0.623, Entropy=3.64

SPATIAL FEATURES: Ch=128, Size=(12, 12), Mean=0.386±0.209, Range=[0.00, 7.59]  
Diversity=0.7045, Sparsity=0.623, Entropy=3.64

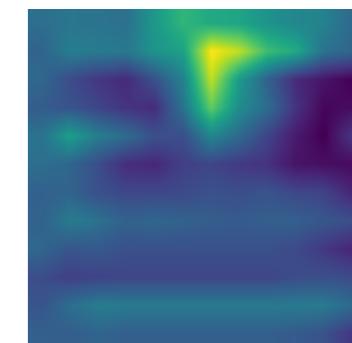
CONV1 Average  
1 channels



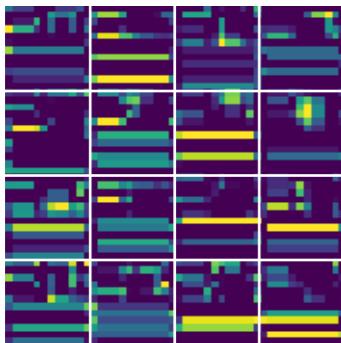
CONV2 Average  
1 channels



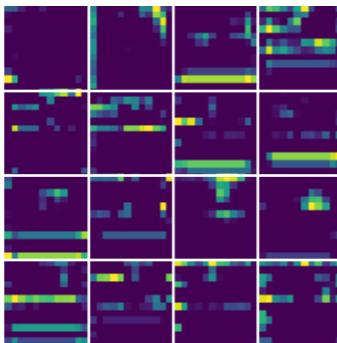
Spatial Features (avg)  
→ Input to Slot Attention



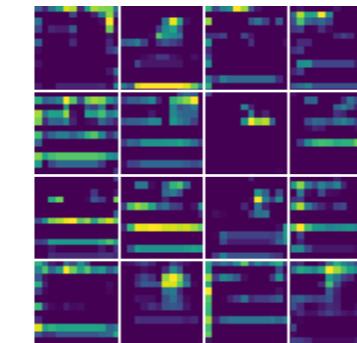
Feature Channels (showing 16/128)



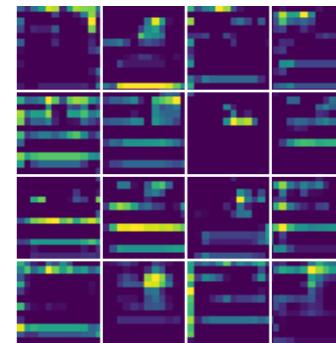
Feature Channels (showing 16/128)



Feature Channels (showing 16/128)



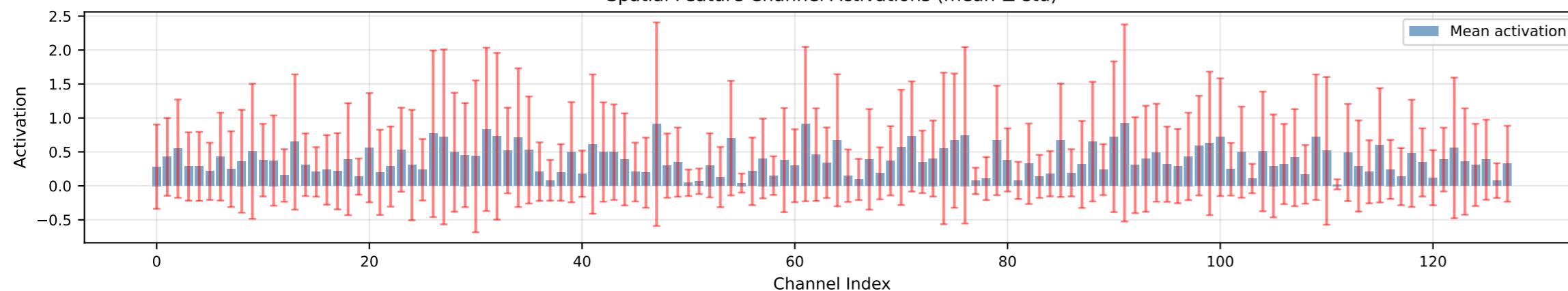
Feature Channels (showing 16/128)



## DIAGNOSIS SUMMARY:

- =====
- GOOD DIVERSITY
- HIGH SPARSITY: Many dead neurons
- GOOD ENTROPY

Spatial Feature Channel Activations (mean ± std)



Spatial Location Similarity  
(sample of 50 locations)

