Sparse Submanifold Neural Network

~20

~50x50

M0

M1

M2

M3

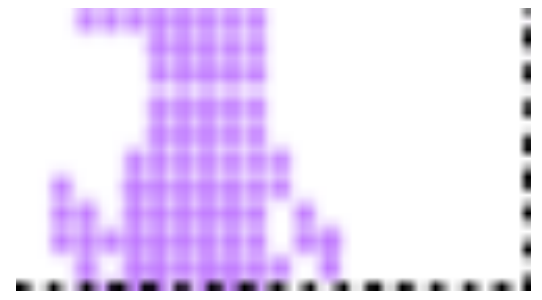
M4

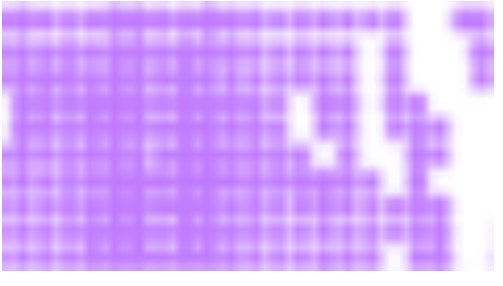
M5

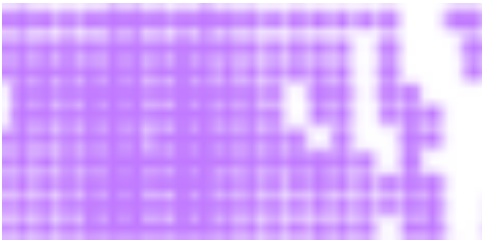
M6

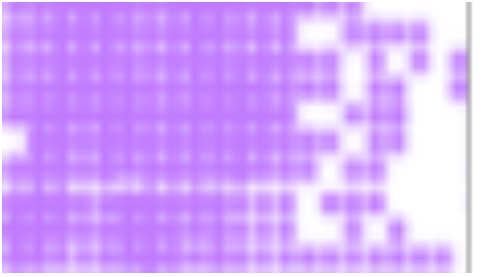
M7

Encoder

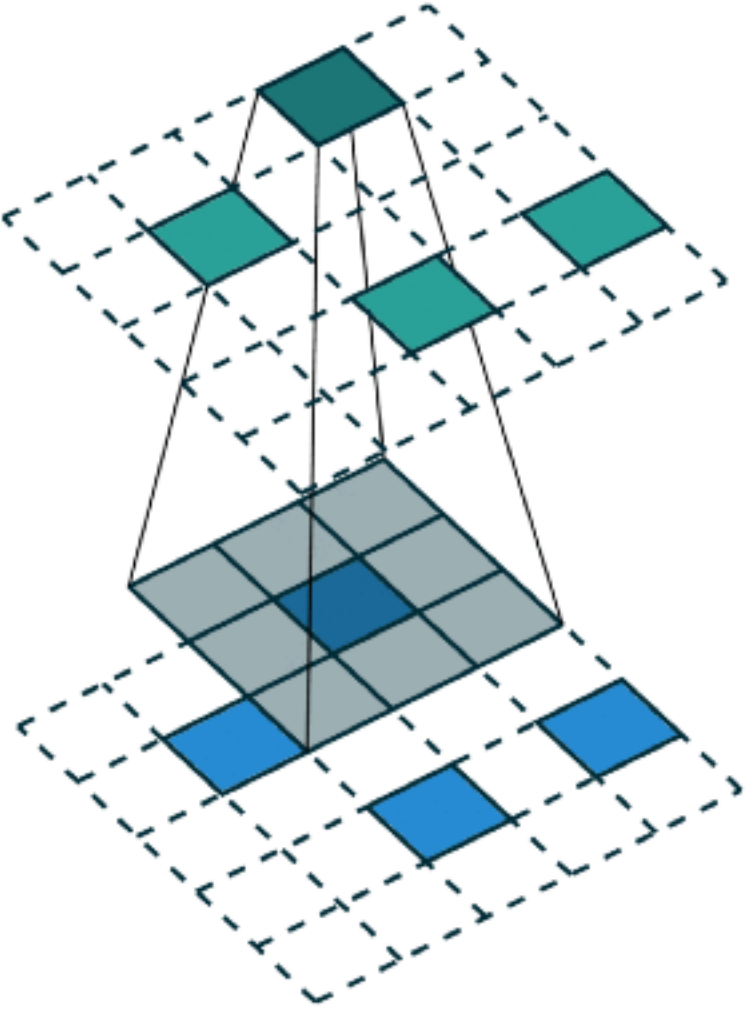


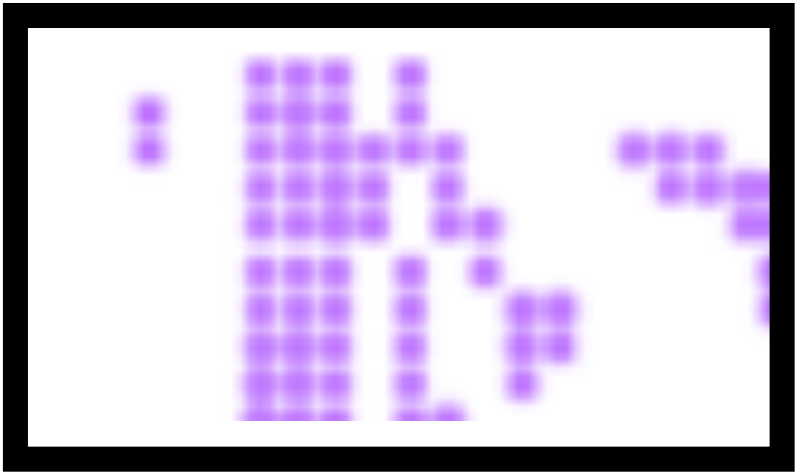






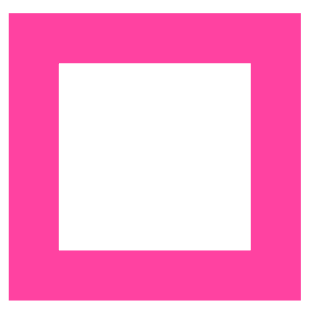
Pre-Training





1 feature

768 features



16x16

1 vector embedding

[redacted]

[redacted]

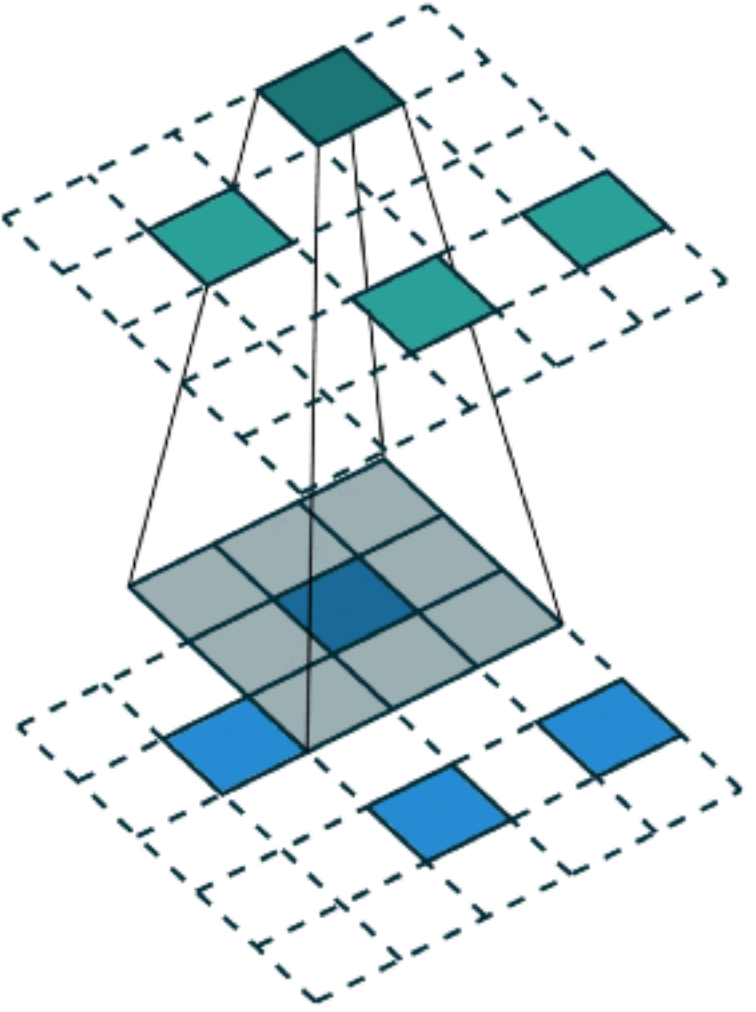
SCNN reduces the spatial coordinates while increasing the feature dimensions.

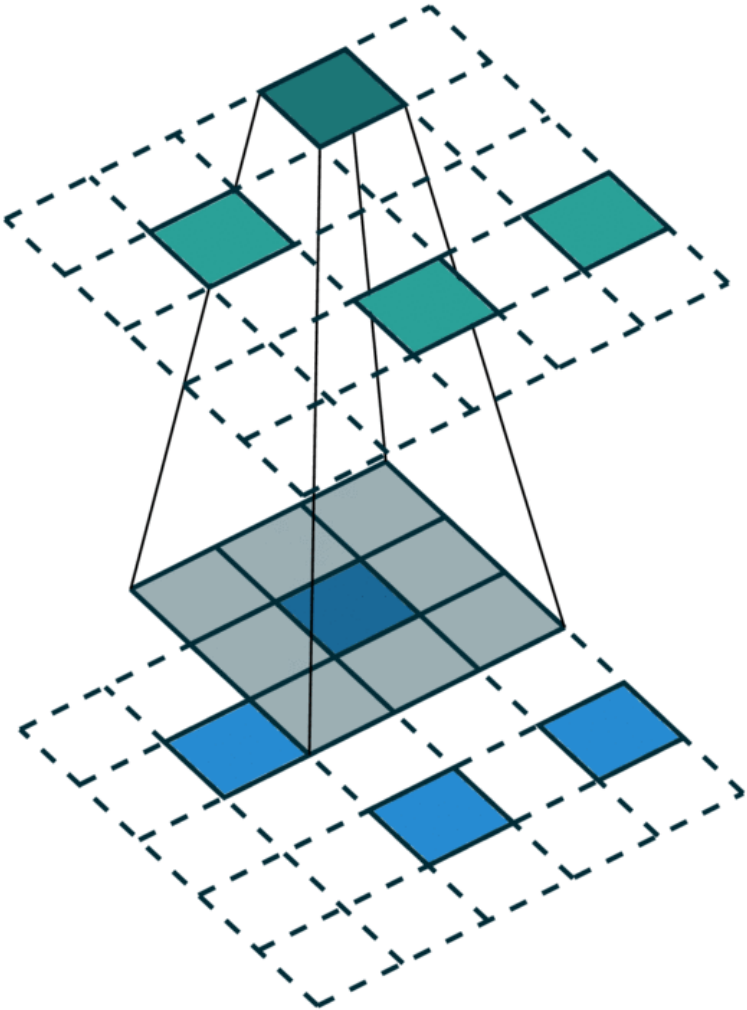
It performs convolution only on active voxels, effectively ignoring the vast empty regions typical in detector data.

SCNN

- **SCNN**: Creates a vector embedding for every patch in the input

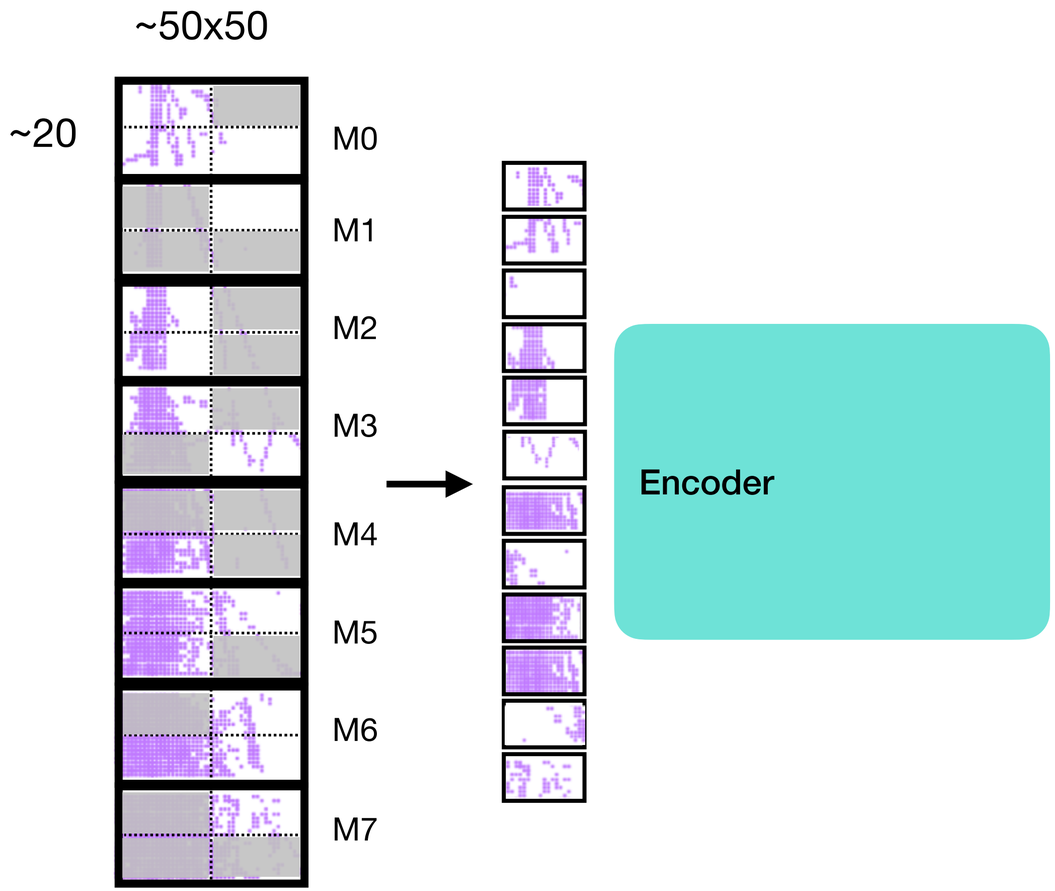
17



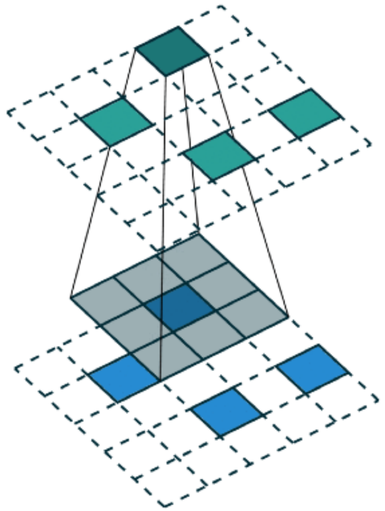


Pre-Training

Sparse Submanifold Neural Network



- **SCNN**: Creates a vector embedding for every patch in the input



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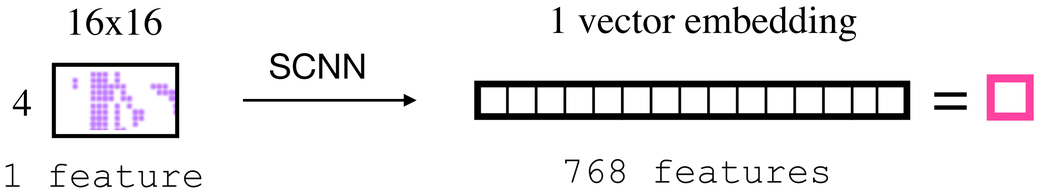
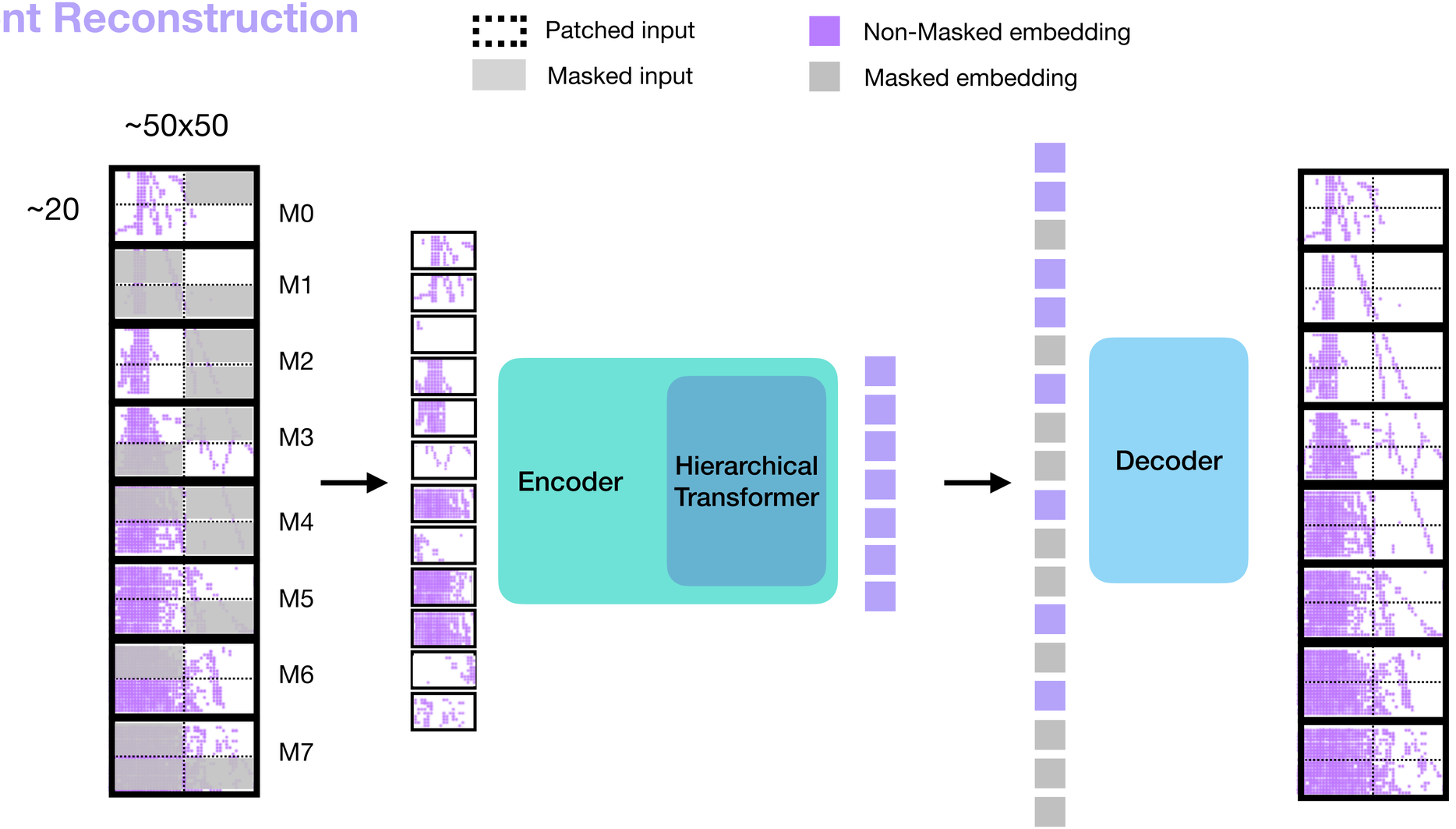


Pre-Training

Event Reconstruction