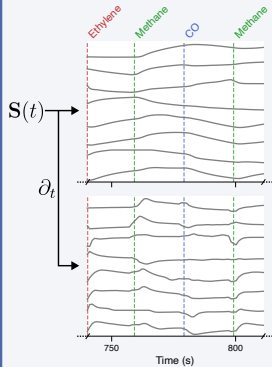


Sensor array



Expand-and-sparsify architecture

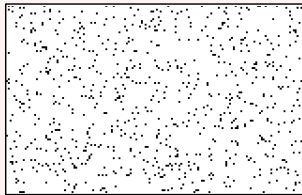
Dense input



$$\mathbf{x} \in \mathbb{R}^M$$

\times

Random sparse binary matrix



$$\mathbf{W}_{\text{HD}} \in \{0, 1\}^{M \times N}$$

$=$

HD projection



$$\mathbf{z}_{\text{dense}} \in \mathbb{R}^N$$

k-WTA

\rightarrow

Sparse output



$$\mathbf{z}_{\text{sparse}} \in \{0, 1\}^N$$

hebbian

\rightarrow

Readout

Class identity estimates

