n x n x n box of neighbors

Localized input

$$U = \{\nabla T, \nabla \vec{u}, \rho, e, P\}$$
or
$$U = \{T, u, v, w, \rho, e, P\}$$

Neural Networks

2D slices of flow field

Global Input

input layer

hidden layer 1   hidden layer 2

output layer

Fully Connected Network

Convolutional Neural Network

Convolution   Pooling   Fully Connected

Input   Output

Feature Extraction   Classification

Convolutional Neural Network

Label/Error for central cell

Output

Label/Error for slice

All flow variables are non-dimensionalized with respect to their mean to allow for generalizability.