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1: Input Shape: (space, time, features)
2: Slide across time to create sequences
3: Convolve across space by:
4:    $(f * g)[n] = \sum_{m=-\infty}^{\infty} f[m]g[n-m]$ 
5: for each sequence & space do
6:    $i\_t = \text{sigmoid}((W_{i\_i} \bullet x_t) + (W_{h\_i} \bullet h_{\text{prev}}) + b_i)$ 
7:    $f\_t = \text{sigmoid}((W_{i\_f} \bullet x_t) + (W_{h\_f} \bullet h_{\text{prev}}) + b_f)$ 
8:    $m\_t = \tanh((W_{i\_m} \bullet x_t) + (W_{h\_m} \bullet h_{\text{prev}}) + b_m)$ 
9:    $o\_t = \text{sigmoid}((W_{i\_o} \bullet x_t) + (W_{h\_o} \bullet h_{\text{prev}}) + b_o)$ 
10:   $C\_t = (f_t \odot C_{\text{prev}}) + (i_t \odot m_t)$ 
11:  Pass latent state through sequences  $\rightarrow$ 
12:    $h\_t = o\_t \odot \tanh(C\_t)$ 
13:  Output Shape: (space, pred\_window)
14:    $\hat{y} = (W_{o\_final} \bullet h\_t) + b_{o\_final}$ 
15:  $\text{loss} \leftarrow \text{MSE or MAPE}(y, \hat{y})$ 
16:  $\nabla \text{loss} \leftarrow \frac{\partial \text{loss}}{\partial \hat{y}} \cdot \frac{\partial \hat{y}}{\partial \theta}$ 
17:  $\theta \leftarrow \theta - \eta \nabla \text{loss}$ 
18: Inference on Vegas, NOLA, Philly, Los Angeles...
19: For EVAL:
20:   $\mathbf{Y}_{\text{integer}} \leftarrow 1(\hat{y} > 0)$ 
21:  for each shift  $s \in \{-1, 1\}$  do
22:    $\mathbf{Y}_{\text{shift}} \leftarrow \text{Shift}(\mathbf{Y}_{\text{integer}}, s)$ 
23:    $\mathbf{Y}_{\text{AUC}} \leftarrow \max(\mathbf{Y}_{\text{shift}})$ 
24:   Apply trapezoidal rule to  $\mathbf{Y}_{\text{AUC}}$ :
25:   Custom AUC Score  $\leftarrow \int_{\text{FPR}}^{\text{TPR}} d\text{FPR}$ 

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