1) Generate windows from time-series data

$G_1 , \ldots , G_m$

time

Window 1
Window 2
Window 3
Window 4

Diverse Training Set

Expression Values

2) Select SWING parameters

Maximum lag, k = 0
- Standard inference
- No time delay

windows

Samples

$X(t)$ $Y(t)$

m columns

Maximum lag, k > 0
- Granger Causal Inference
- k possible lags
- Improved inference

$X(t)$ ... $X(t-k)$ $Y(t)$

m x k columns
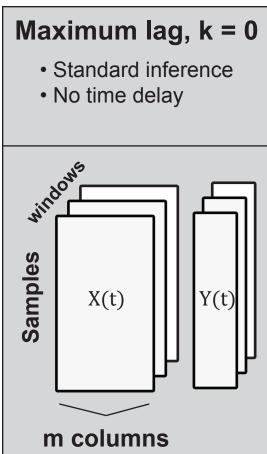
3) Infer network using selected method

$A_{t=0}$ → $B_{t=2}$
$A_{t=0}$ → $C_{t=1}$
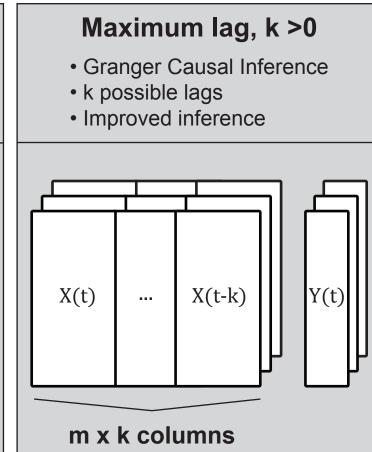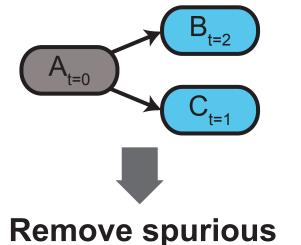
Remove spurious
4) links via permutation and F tests

$p > 0.05$
$A_{t=0}$ ✗ $B_{t=2}$
$A_{t=0}$ → $C_{t=1}$
$p < 0.05$