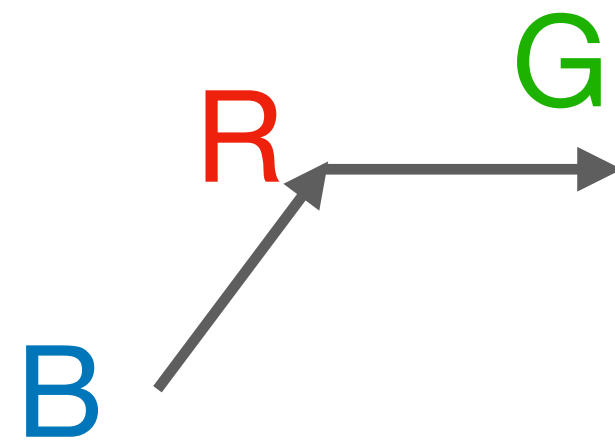# Geometric Priors : Smoothness Loss

$$\mathcal{L}_{\text{smooth}} = \frac{1}{|\mathcal{V}|} \sum_{(n,t) \in \mathcal{V}} \left\| \mathbf{p}_{n,t+1} - 2\mathbf{p}_{n,t} + \mathbf{p}_{n,t-1} \right\|_2^2$$

G

R

B

$$(p_2 - p_1) - (p_1 - p_0)$$

Second finite difference

Penalizes abrupt change in velocity

Soft argmax

$$\hat{\mathbf{x}} = \sum_i \mathbf{p}_i \cdot \frac{\exp\left(\frac{\mathbf{h}_i}{\tau}\right)}{\sum_j \exp\left(\frac{\mathbf{h}_j}{\tau}\right)}$$

To decode key points for computing geometric priors and keep it differentiable for training