Sufficient dimension reduction (SDR)

- Projection matrix $\mathbf{W}$ is often obtained by gradient ascent:

$$\mathbf{W} \leftarrow \mathbf{W} + \varepsilon \nabla J(\mathbf{W})$$

- $J(\mathbf{W})$ is some SDR criterion.
- E.g., Quadratic Mutual Information

Existing method

- Calculates derivative of the estimated $\hat{J}(\mathbf{W})$: $\nabla \hat{J}(\mathbf{W})$

Propose method

- Directly estimates the derivative: $\widehat{\nabla} J(\mathbf{W})$