

- Since

$$Ed\tilde{d}(X, \hat{X}) = Ed(X, \hat{X}) - \Delta,$$

where  $\Delta$  does not depend on  $p(\hat{x}|x)$ , we can always replace  $d$  by  $\tilde{d}$  and  $D$  by  $D - \Delta$  in the definition of  $R_I(D)$  without changing the minimization problem.

- Without loss of generality, we can assume  $d$  is normal.