- Let n be large.
- $\Pr\{\tilde{\mathbf{X}}(1)$ jointly typical with $\mathbf{Y}\} \to 1$.
- For $w \neq 1$, $\Pr\{\tilde{\mathbf{X}}(w)$ jointly typical with $\mathbf{Y}\} \approx 2^{-nI(X;Y)}$.
- If $|\mathcal{C}| = M$ grows at a rate $< I(X;Y)$, then

$$\Pr\{\tilde{\mathbf{X}}(w) \text{ jointly typical with } \mathbf{Y} \text{ for some } w \neq 1 \}$$

  can be made arbitrarily small.
- Then $\Pr\{\hat{W} \neq W\}$ can be made arbitrarily small.