

- In the formula

$$C(P) = \sup_{F(x): E\kappa(X) \leq P} I(X; Y),$$

$X$  can be a mixed random variable, so it is difficult to consider sequences that are typical w.r.t.  $F(x)$ .

- Need a new notion of joint typicality – **mutual typicality**.
- Recall that for any input distribution  $F(x)$ ,  $f(y)$  exists as long as  $f(y|x)$  exists. Hence

$$I(X; Y) = E \log \frac{f(Y|X)}{f(Y)}.$$