

Mutual Information $I(x; y)$.

$$I(x; y) = H(x) - H(x|y)$$

Mutual Information represents the uncertainty about the channel input that is resolved by observing the channel output.

properties.

1. $I(x; y) = I(y; x)$
2. $I(x; y) \geq 0$
3. $I(x; y) = H(y) - H(y|x)$
4. $I(x; y) = H(x) + H(y) - H(x, y)$