

Proposition 2.21 The mutual information between a random variable X and itself conditioning on a random variable Z is equal to the conditional entropy of X given Z , i.e., $I(X; X|Z) = H(X|Z)$.

Proposition 2.22

$$I(X; Y|Z) = H(X|Z) - H(X|Y, Z),$$

$$I(X; Y|Z) = H(Y|Z) - H(Y|X, Z),$$

and

$$I(X; Y|Z) = H(X|Z) + H(Y|Z) - H(X, Y|Z),$$

provided that all the conditional entropies are finite.