

**Example 3.17 (Data Processing Theorem)** If  $X \rightarrow Y \rightarrow Z \rightarrow T$ , then

- $I(X; T) \leq I(Y; Z)$
- in fact

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