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Formal Methods in Networked Systems

The Discrete Noiseless Channel

In the more general case with different length of symbols and constraints on the allowed sequences, we make the following definition:

The capacity C of a discrete channel is given by

$$C = \lim_{T \rightarrow \infty} \frac{\log N(T)}{T}$$

where $N(T)$ is the number of allowed signals of duration T .

Theorem

$$C = \lim_{T \rightarrow \infty} \frac{\text{Log} A X_0^T}{T} = \log X_0$$