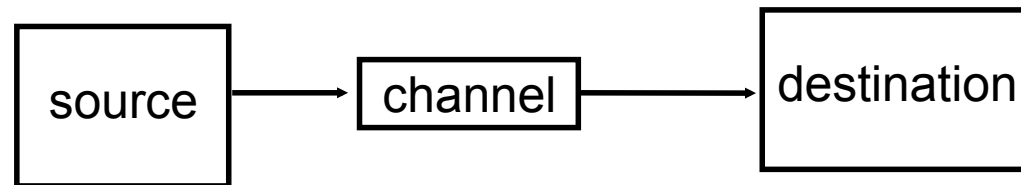
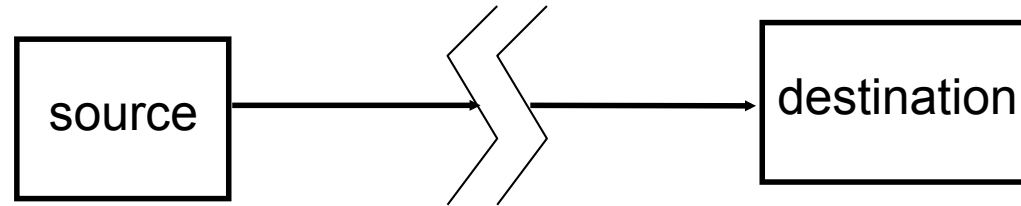


The Communication Model



e.g. magnetic disk

CD

telephone

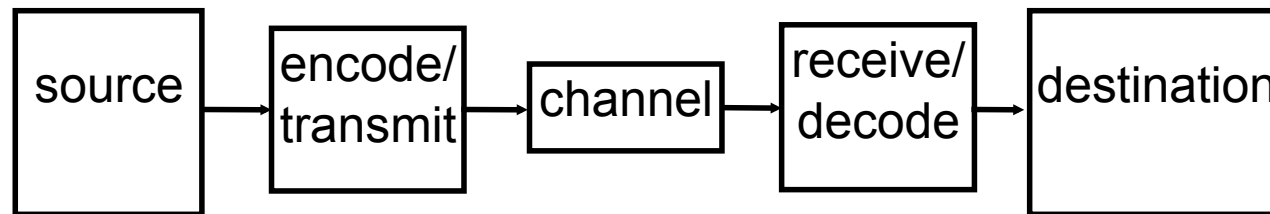
smoke signal

morse code

Claude Shannon

C.E. Shannon, "A Mathematical Theory of Communication",
Bell System Technical Journal, vol. 27, pp. 379-423,
623-656, July, October, 1948

Shannon Weaver Model



message → *signal* → *message*

↑
NOISE

What is Information Theory?

- Measuring and comparing how much information is generated by an entity or system.
- Maximise information efficiency
- Focus: Channel Capacity
- Mechanistic model
- Linear, unidirectional
- Quasi Causality
- Reductionism

Shannon

- Unit of information is the bit (binary digit)
—unit of choice or uncertainty
- Rate of information flow—(bits per second)
also called the entropy (rate of reducing
uncertainty)
- Channel capacity—bandwidth

What is information?

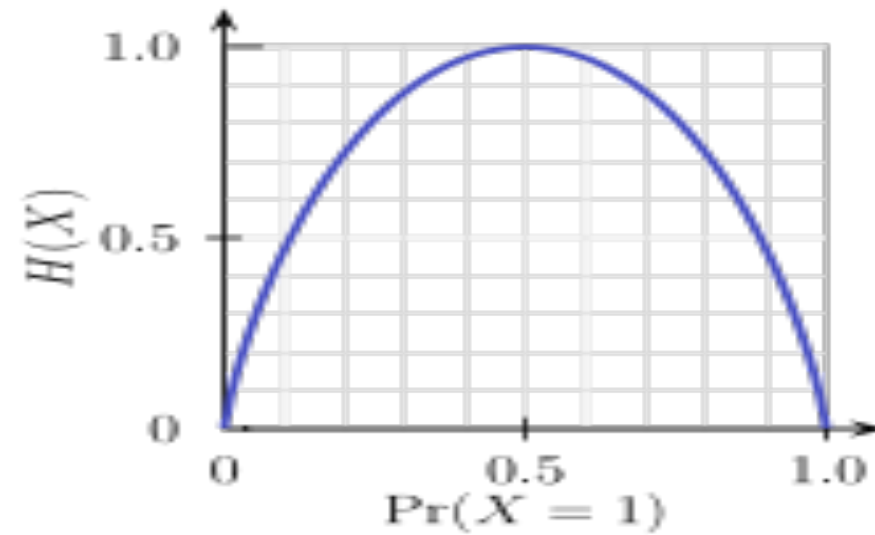
- Information is what you do not know
- Information must have some order for it to be useful
- Information is inversely related to uncertainty
- **INFORMATION IS NOT MEANING**
- Sources of information:
 - Anything in the universe that is not completely random
 - DNA
 - Traffic light sequence

Channel Capacity

- If $C > H$ = no limits
- If $C < H$, then uncertainty will increase

Bit

- A fair coin toss has an entropy of one bit.



Entropy

- **entropy** is uncertainty associated with a random variable
- Minimum message length necessary to communicate information.

Extensions of the Math Model of Communication

- Feedback system
- Artificial intelligence
- Cybernetics
- Informatics

Other impacts

- Gatekeeper
- Communication breakdown
- Overload
- Underload