



UESTC4004

Digital Communications

Introduction

Communications – from fire signals to brain signals



<https://www.youtube.com/watch?v=0ay2Qy3wBe8>



<https://www.youtube.com/watch?v=uehHMvhlBek>



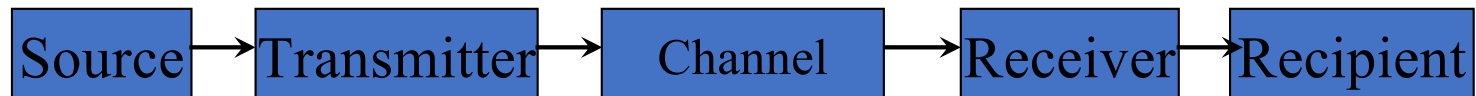
Activity

- Discuss within your breakout rooms what could be the possible **applications** of communication systems.
- One representative from each breakout room will share a list of applications.

No Chinese, please. Also, avoid inappropriate language.

Communication Systems

- Main purpose of communication is to transfer information from a source to a recipient via a channel or medium.
- Basic block diagram of a communication system:



Brief Description of common terms

- **Source:** analog or digital
- **Transmitter:** transducer, modulator, power amplifier, antenna
- **Channel:** e.g., cable, optical fiber, free space
- **Receiver:** antenna, amplifier, demodulator, transducer
- **Recipient:** e.g., person, (loud) speaker, computer
- **Types of information:** voice, data, video, music, email etc.
- **Types of communication systems**
Public Switched Telephone Network (voice, fax, modem), Satellite systems, Radio, TV broadcasting, Cellular phones, Computer networks (LANs, WLANs)

Discussion - What features should a good communication system have?

- 1.
- 2.
- 3.
- 4.
- 5.

- Discuss within your breakout rooms and share the list through your representatives.

Warning - don't go to the next slide!



Goals in Digital Communication System Design

- To maximize transmission rate
- To maximize system utilization
- To minimize bit error rate
- To minimize required systems bandwidth
- To minimize system complexity
- To minimize required power



Point to ponder...

What should be my priorities for next 4 months?