Department of Computer Science
National Chiao Tung University, Hsinchu

Principles of Communications Networks

網路通訊原理

Before We Start the Lecture...

- Can we re-schedule our class from Wednesday CD & Friday G to **Wednesday CDX**?
- Seat allocation!!!
- Online sign in (**無關點名**)
- 同步/非同步線上上課

Course Information

- Lecture: Hsi-Lu Chao
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- Teaching Assistant—林聖傑、周晉弘
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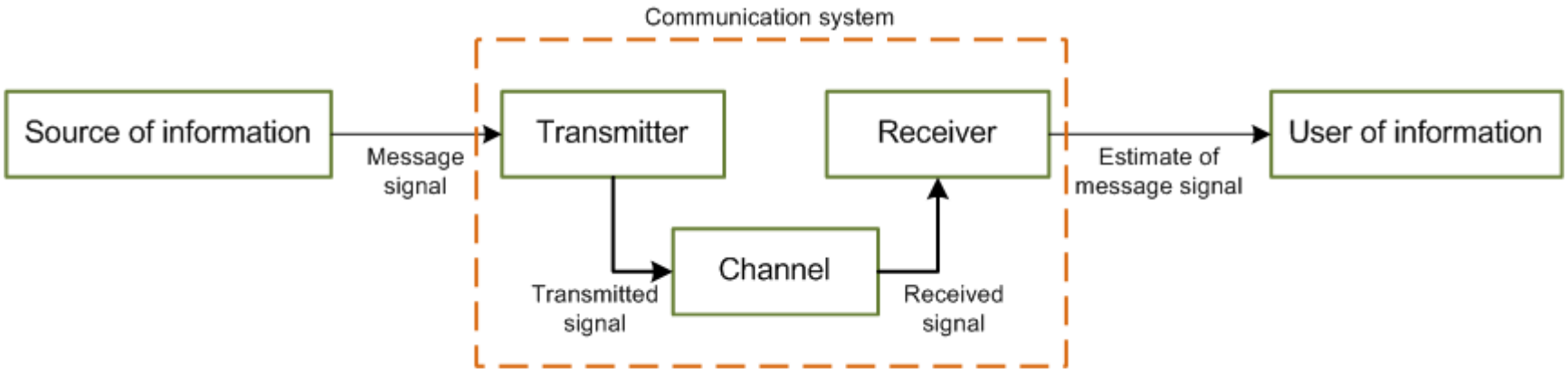
  - Lab: EC 446B
- Course website: new e3
  - Website: https://e3new.nctu.edu.tw/login/index.php
- Reference books
  - "Introduction to wireless and mobile systems" by Dharma Prakash Agrawal and Qing-An Zeng
  - "Communication Systems" by Haykin
  - "Principles of Communications Systems, Modulation, and Noise" by Ziemer

How to Form a Communication Network?

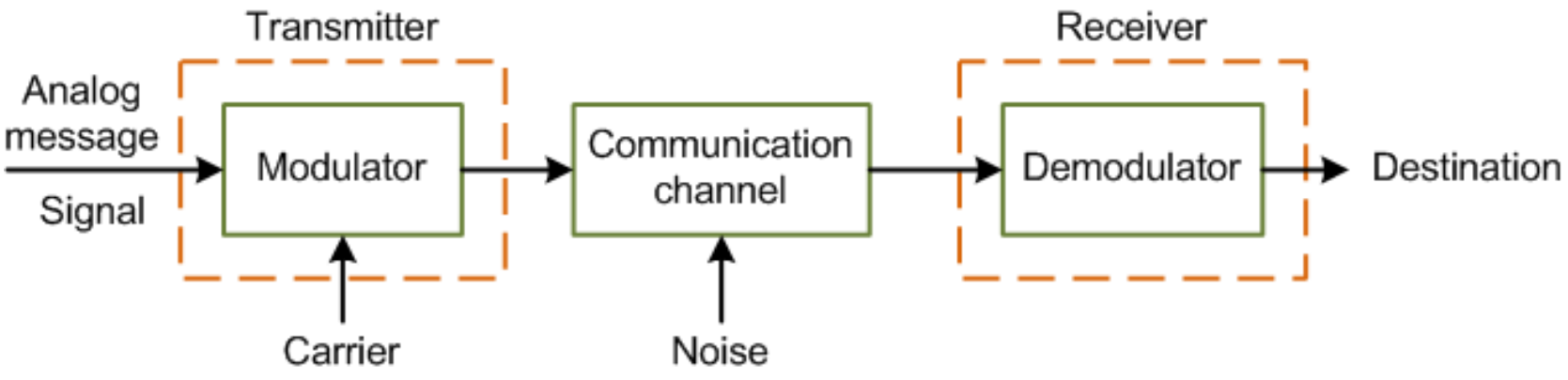
- The answer is adopting the common protocols and standards among entities
- Let's revisit the TCP/IP model, do you remember the function of each layer?

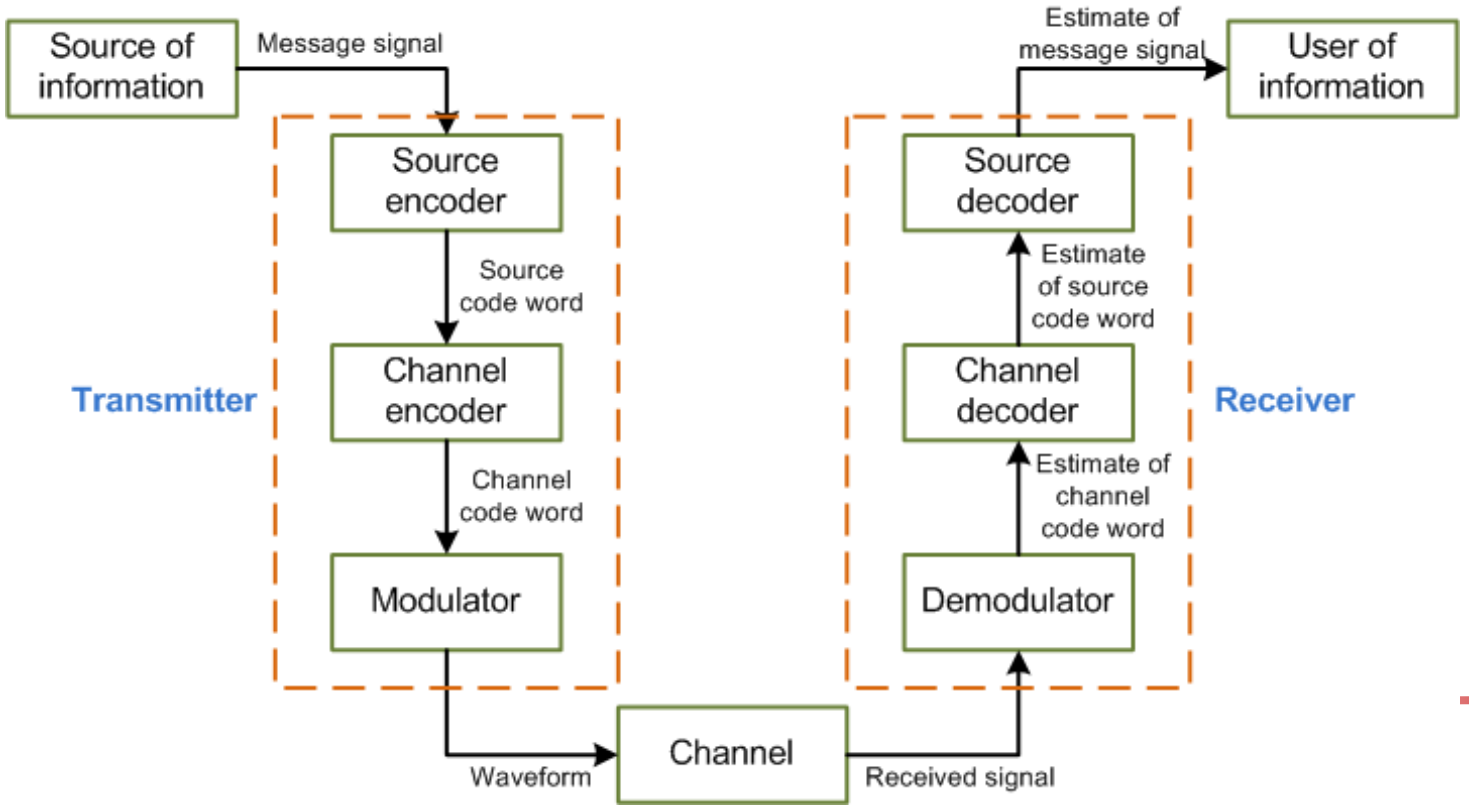
Communication System

- Transmitter: e.g., you (your portable equipment)
- Receiver: e.g., your friend's portable equipment
- Channel: either wired or wireless



Analog v.s. Digital Communications





WAN First? Or LAN First?

- Is roaming important to customers?
- Which one is more important to you? Internet access or voice service?
- Can we expect a heterogeneous network consisting of cellular and WiFi networks?

Lecture Materials

	Topic
1	Syllabus and background/preview
2	Channel coding
3	Modulation
4	Propagation model
5	Cellular concept
6	Multiple radio access
7	Channel allocation
8	WAN part -- GSM(2G)/3G/LTE/LTE-A/5G
9	LAN part -- 802.11a/b/g, 802.11ac, 802.11ad, 802.11af, 802.11ax
10	Concepts of interference control

Grading

- Homework: 35%
- Midterm exam: 30%
- Final exam: 35%