IS1211/IS2111
Computer Networks

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Who am I?

- Head of the department of Computation and Intelligent Systems.
- Head - Internal Undergraduate Degree Programmes
- Education
    - B.Sc. (Comp. Sci.) - University of Colombo -1997.
    - M.Sc. - University of British Columbia, Canada - 2000.
    - Ph.D. - University of British Columbia, Canada - 2005.
- Marie-Curie Fellow at SICS Swedish ICT, Stockholm, Sweden (2013 - 2014).
- Teaching
    - Operating Systems.
    - Computer Networks.
    - Theoretical Computing.
    - Cryptographic Systems

Learning Outcomes

- ▶ Explain the principles underlying the layered systems architectures and their application to computers networks.
- ▶ Describe the functionality and the role of different hardware and software components used in networks.
- ▶ Apply the core concepts underlying IP networks to solve simple network design problems, including IP subnetting.

Course Contents

ACM IS 2010 – Networking subtopics of IS 2010.4 IT
Infrastructure

- ▶ Introduction to Computer Networking
- ▶ Data Communication in Computer Networks
- ▶ Physical Layer
- ▶ Datalink Layer
- ▶ Network Layer
- ▶ Transport Layer
- ▶ Application Layer
- ▶ Network security
- ▶ Software Defined Networks

Reading

- **Computer Networks** by Andrew S. Tanenbaum
- **A Practical Guide to Basic Networking** by Tharindu Wijethilake, Chamath Keppitiyagama, Kenneth Thilakarathna, and Ajantha Atukorale

Evaluation

- Continuous Assessment: 40%
  - One assignment per week
- Final Paper: 60%

Past Papers

- IS2111
- IS2011
- ICT1010

Data Communication

Some concepts

- Symbols
- Protocol
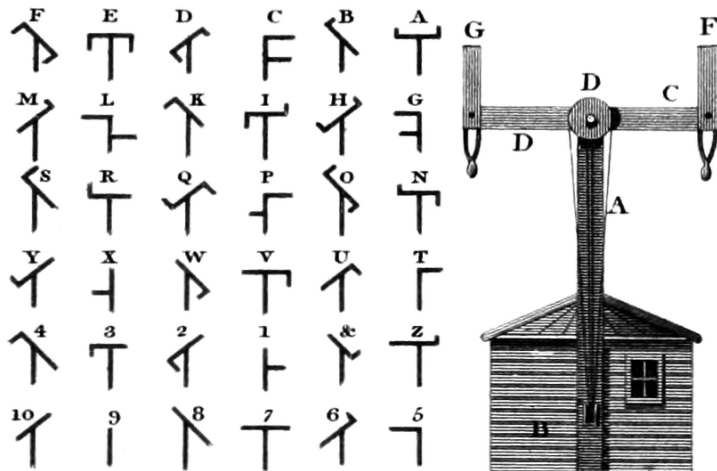- Encoding
- Baud rate
- Bit rate

Semaphore Telegraph

image credit: Wikipedia

Light Signals

image credit: Wikipedia

Light Signals - Two Symbols and Two Messages
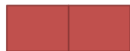
We won !

We Lost !

Interpret Two Signals at a Time

We won !

It was a draw !

It is raining !

We Lost !

▶ How long should we flash the light for one symbol?

Bits

| 0 | 0 | We won !

| 0 | 1 | It was a draw !

| 1 | 0 | It is raining !

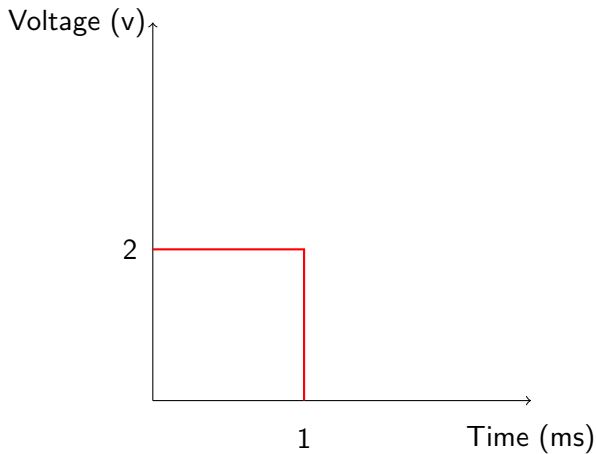| 1 | 1 | We lost !

String of Bits

1011001111001010100101
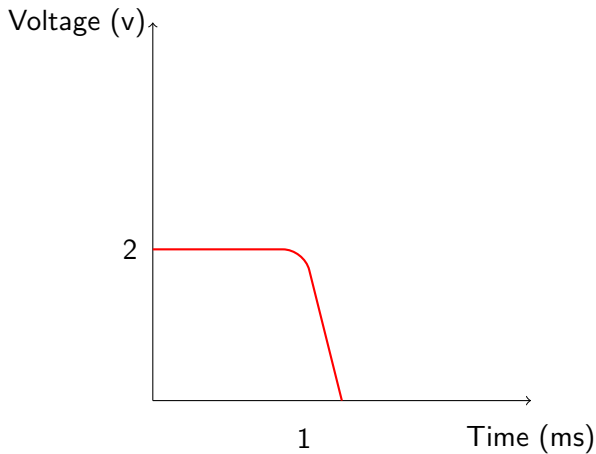
A Frame

1011001111001010101010100101

A digital signal with two levels
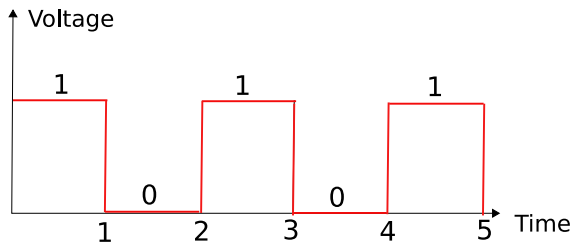
What is wrong ?

Slew Rate

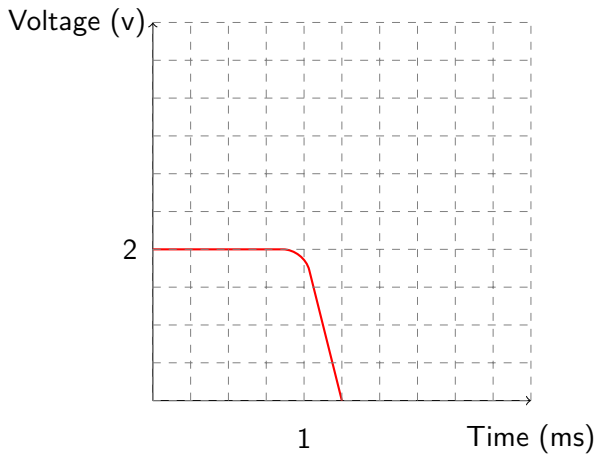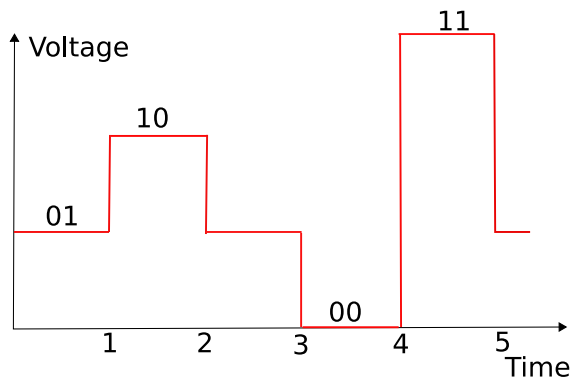# Slew Rate

A signal with four levels

Bits and Bauds

- Baud rate = ??? per second
- Bitrate = ??? per second