DATA TRANSMISSION

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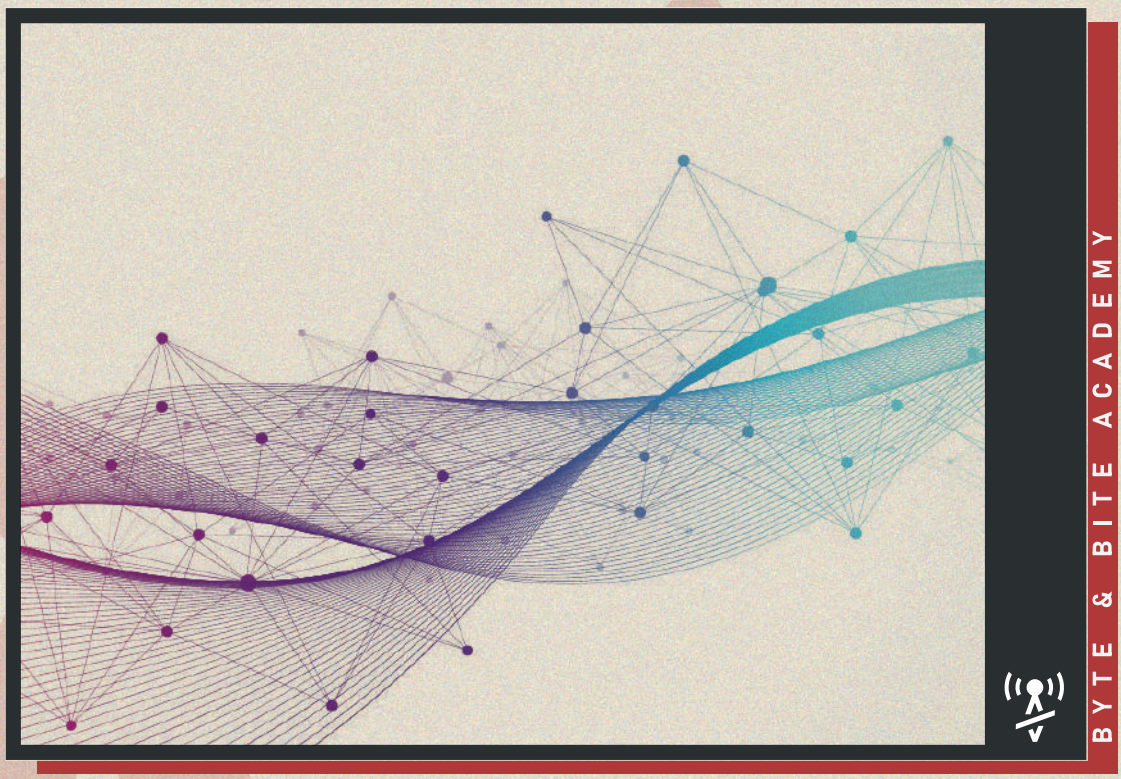

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OVERVIEW

Communication systems enable transmitting information (such as sound, image, or message) from a source to a receiver. These systems transmit the information from the sender through a specific channel, and the receiver processes this information. A basic communication system consists of three main components: the transmitter, the channel, and the receiver. The transmitter converts the information into a transmittable format, the channel carries the information, and the receiver decodes and interprets it. Today, these systems operate through both wired and wireless channels, leveraging digital technologies to facilitate fast and reliable data transmission.

WORKSHOP DESCRIPTION

This workshop is designed to provide an understanding of the fundamental principles of data transmission in communication systems. It covers key concepts, from data digitization to modulation techniques, as well as the characteristics of wired and wireless channels and applications of image and audio transmission. Theoretical concepts will be explained in a simple and accessible manner. Throughout the workshop, participants will reinforce their learning through MATLAB-based hands-on examples and gain insight into the real-world applications of communication system techniques.

📌 Who Should Take This Course?

- Electrical and electronics engineering students
- Those interested in telecommunications and information technologies
- Individuals who want to gain hands-on experience in communication systems using MATLAB
- Those seeking fundamental knowledge in modulation and data transmission

⏱️ Workshop Duration and Structure

The workshop lasts a total of **1.5 hours** and is conducted as a single session. During this time, the fundamental principles of communication systems will be covered theoretically and reinforced with MATLAB-based hands-on examples.

🎯 What Will You Gain from This Workshop?

- Understanding the fundamental principles of communication systems

- Understanding the process of data digitization
- Exploring modulation techniques
- Analyzing wired and wireless channel structures
- Conducting data transmission simulations using MATLAB

WORKSHOP CONTENT

SECTION-1: Transmitter Design

1. Data Digitization

- Digitization of image data
- Television resolution values
- Digitization of audio data

2. Modulation

- Properties of the cosine signal
- Types of modulation
- Phase Shift Keying (PSK)

SECTION-2: Channel Structure

- Wired Channel
- Wireless Channel

SECTION-3: Image Transmission

- Application-1: MATLAB-Based Image Transmission

SECTION-4: Audio Transmission

- Application-2: MATLAB-Based Audio Transmission

FREQUENTLY ASKED QUESTIONS

1. Is the course free?

Yes, there is no fee required to participate in this workshop.

2. Do I need any prior knowledge to join the workshop?

This workshop is designed for those who want to gain fundamental knowledge about communication systems. However, having a basic understanding of engineering mathematics (e.g., signals and matrix operations) will help you better grasp the content.

3. Do I need to have MATLAB software?

No, having MATLAB software is not required to follow the workshop. However, access to MATLAB can be beneficial if you want to test the provided codes and reinforce the topics. You can visit MathWorks' website for MATLAB installation.

4. 4. What level will I reach by the end of the workshop?

By the end of the workshop, you will have a solid understanding of the fundamental principles of communication systems, including data digitization and modulation techniques. Additionally, you will gain basic knowledge of performing image and audio transmission simulations by following MATLAB-based applications.

5. Will the workshop materials be shared?

Yes, all workshop materials will be available on our GitHub account. Don't forget to give a star to the repository :)