Digital Signal Processing

1. Course Description

In this course, we learn the digital signal processing to pick the purpose signal by measuring the analog signal, its digitalization and convert mathematically. First, we learn the signal type, continuous-time system, discrete time system and difference equation. Then, we lean the designing of the digital filter. This course is related to DP4E.

2. Course Objectives

(1) We will learn about basic of Fourier analysis; moreover, we will be able to execute procedures including 1-dimensional discrete Fourier transform
(2) We will learn how to find differential equation form block diagram
(3) We will learn how to estimate and program property of digital filter

3. Grading Policy

Evaluation rate are 30% of Report and 70% of Exams.
All the reports should be submitted.

4. Textbook and Reference

Textbook
No textbook in this course, but we use LMS and handouts.

5. Requirements(Assignments)

Preparation for the class: 1.5 hours
Review of the class ：1.5 hours

6. Note

Course contents might be modified.

7. Schedule

[1]   Guidance
         Basic math for this class
         Signal and Systems (Continuous-time system and discrete time system)
[2]   Fourier Series Fourier transform
[3]   Linear Time-invariant Discrete-time Systems 1: Time domain
[4]   Linear Time-invariant Discrete-time Systems 2: Frequency domain and z-transform
[5]   Linear Time-invariant Continuous-time Systems (System representation in frequency domain and Laplace transform)
[6]   Sampling theorem and summary
[7]   Midterm exam and review
[8]   Analog and Digital filter
[9]   Character of filters
[10]   Designing of filter 1: FIR filter
[11]   Designing of filter 2: IIR filter
[12]   Designing of filter 3: Comb filter
[13]   Designing of filter 4: Filter designing exercise
[14]   Summary
         2-dimenssional signal processing
         Concept of adaptive signal processing
[15]   Final exam and review