E9291 Aug 2:1

DSP System Design

Instructor

Rathna G N
Email: rathna@iisc.ac.in

Teaching Assistant

Email:

Department: Department of Electrical Engineering

Course Time: Mon., 3:30-4:30PM Fri., 10 - 11AM

Lecture venue: B304 in Electrical ENgineering

Detailed Course Page: http://www.ee.iisc.ac.in/academics-courseprograms-details.php#E9291

Announcements

The first lecture of the course was on August 7th 2017 in B 304, EE

Brief description of the course

This course gives the knowledge of architecture of the xilinx hardware used and students have to develop

various algorithms using this hardware.

Prerequisites

Knowledge of Digital SIgnal Processing

Syllabus

DSP Architecture: Single Core and Multicore; Pipelining and Parallel Processing; DSP algorithms:

Convolution, Correlation, FIR/IIR filters, FFT, adaptive filters, sampling rate converters, DCT, Decimator,

Expander and Filter Banks. DSP applications.

Course outcomes

Students will have the in depth knowledge of hardware they have used, how to write their programs using

fixed and floating point implementations. How to pipeline/parallelize the algorithms on the hardware to have

either reduce the power consumption or increase the speed of operation of algorithms.

Grading policy

30% from test1 and mid term

15% from assignments(8 in this semester)

15% from miniproject

40% from Final Exam

Assignments

1. Number system familiarization(both fixed and floating point)

2. Sine wave generation using IIR filter

3. Quantization effects

4. Scaling and quantization effects on bandpass filter

5. VHDL programming

6. FFT implementation using xilinx blocks

7. Multi rate, multistage implementation

8. Compression of images using DCT

9. Adaptive filter design using LMS, NLMS and RLS algorithms with real time audio input

Resources

Rulph Chassaing, Digital signal processing and applications with C6713 and C6416 DSK, Wiley, 2005

Keshab K Parhi, VLSI Digital Signal Processing Systems:Design and Implementation, student Edition, Wiley, 1999.

Nasser Kehtarnavaz, Digital Signal Processing System Design: LabVIEW-Based Hybrid Programming, Academic Press, 2008

Current Literature.