Course Title

0512-4290 Digital Signal Processing Lab

Lecturer

Academic Supervisor – Prof. Raga Giryes
Lab Instructor – Roi Raich

Semester

Spring 2021-2022

Course requirements

Intro. to DSP, Intro. to Statistical signal processing (may be taken in parallel or through self-studying of the required material for the lab),

Final grade components

Lab experiments, lab reports, and the instructor assessment.

Course schedule

Experiment	Subject and Requirements
1	Introduction to the environment & fixed-point arithmetic
2	Basic signal processing operations
3	Digital filtering
4	Adaptive digital filtering
5	Spectral analysis (DFT & FFT) (2 lab session)
6	Spectral analysis of stochastic processes (2 lab sessions)

Required course reading

Manolakis, Dimitris G. and Vinay K. Ingle, Applied digital signal processing: theory and practice, chapter 6, sections 9.2-9.3 "IIR system structure" and "FIR system structure", Ch. 15.1 "number representations" Cambridge university press, 2011.
Neil Robertson, "A Direct Digital Synthesizer with Arbitrary Modulus", DSPrelated.com, Jun. 3, 2019,
Neil Robertson, "Design IIR Band-Reject Filters", DSPrelated.com, Jan. 17, 2018,
A. Papoulis, ch. 13 in Probability, Random Variables and Stochastic Processes (4th Ed.), McGraw-Hill, 2002.
J.G. Proakis, D.G. Manolakis, chapter 12 in Digital Signal Processing (4th Ed.), Maxwell Macmillan Int., 2007.
Plus other materials provided on the course website

Comments

The lab is performed on a Xilinx Zedboard development kit that includes. Sampling circuits, programmable logic (FPGA), and an ARM processor. The experiments are based on hardware(Verilog) and software (C code) implementations.