CSE237C Final Project Proposal

Henrik Larsson Hestnes

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FM Radio on Pynq

Description

For my final project in this course, I want to build an FM Demodulator using the RTL2832 RF tuner. I will start by developing different functions to implement the scikit-dsp-comm mono-FM, whose documentation can be found here. More specifically, the three main parts downsampler, linear filter and discriminator will be used to implement this is Vitis HLS. I will then integrate this Demodulator onto the Pynq Board, before I integrate this design with the base overlay to make use of the audio instance on the board. It is of the essence to make this code run rapid on the Pynq Board, as these FM-signals are sampled in real time, and has to be handled quickly in order obey Nyquist Sampling Theorem to avoid aliasing. I will also do some visualization of the data if time allows. If this project sounds familiar, it is because this is one of the example projects suggested in one of the lectures, and can be found here.

Deliverables

The key deliverables of this project will be a recorded demo, as I am connecting to my Pynq Board through my home Wi-Fi. I will also deliver a report describing my approach, progress and findings.

Timeline

As the date stated in the "Final Project Presentation", Thursday December 10 is not a Thursday I suppose this years presentations will be on the due date stated on Canvas, Thursday Desember 2, and the timeline shown in fig. 1 is planned accordingly. The report will be worked on throughout the whole project, and be finished up in the days following the presentation.

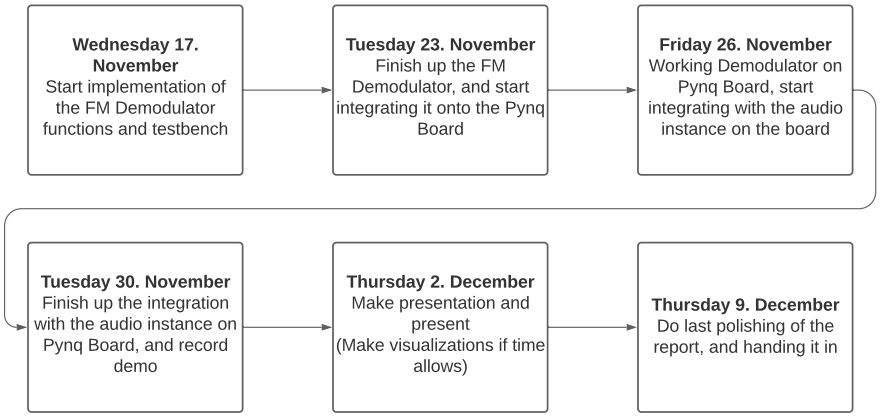

Figure 1: Tentative timeline

Project Requirements

To complete this project, I additionaly need an RTL-SDR RF tuner to sample the RF signals. Professor Kastner mentioned in an earlier lecture that this could be possible to borrow for the project, so I sent him an e-mail 15. November asking if that might be possible. I will send him a reminder tomorrow if I do not hear anything. Other than this I do not need any equipment to complete this project.