DSP EEE F434: Practical 2
Operations on Discrete-Time Sequences

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Projects

Please make a group of 2 to work on projects in addition to the conventional practical exercises.

- Project 1: Analysis of birds voices (Names?)
- Project 2: ECG data analysis (Vidit Niriv Jha and R Niranjan)
- Project 3:Transceiver design (Names?)
- Project 4: Financial Trading (Names?)

Task 1: Operations on Discrete-Time Sequences

Everyone should bring a headphone.

1. Download 5 different audio files of voices for simple words (as per your preference or requirements) in *.wav format from the website: http://www.pacdv.com/sounds/voices-1.html
2. Read the sampled data (i.e. data sequences $y(n)$) from these audio files. Plot the sequences.
3. Play the sampled data of each audio file and verify the collected data.
4. Verify these operations on each audio data (i) Scaling in amplitude $ay(n)$, where a can be a positive integer (ii) Delay $y(n-N)$, where N should be choose appropriately (iii) Reversal $y(-n)$ (iv) Up-sampling with a factor 2, 3, 4 etc. (v) Down-sampling with a factor 2, 3, 4 etc.

Task 2: Effect of Noise on Audio Signal

1. Add a zero-mean Gaussian noise to one of the audio signal. $y_2(n) = y(n) + w(n)$, where $w(n)$ is additive white noise.
2. Choose appropriately the amplitude of noise to get a noticeable effect.
3. Apply an algorithm on $y_2(n)$ to remove the effect of noise.