Project 2: Psychoacoustic Ear Model found in modern Audio codecs

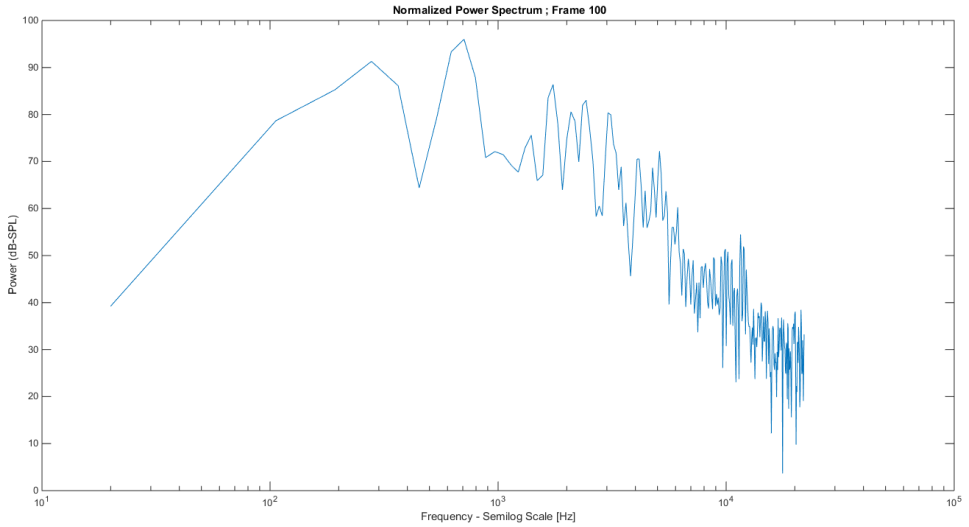
Introduction

For this project you will implement the Psychoacoustic Ear Model II utilized in MPEG-1 layer III and described in ISO/IEC 11172-3. Additionally, you will implement **one extra** element to further reduce bit utilization and improve overall compression ratio.

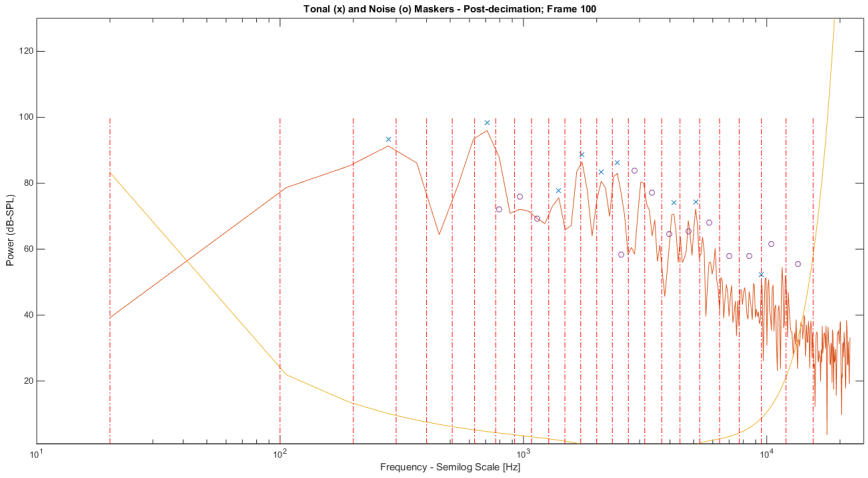
Requirements

Implement a Psychoacoustic Ear Model with the following stages:

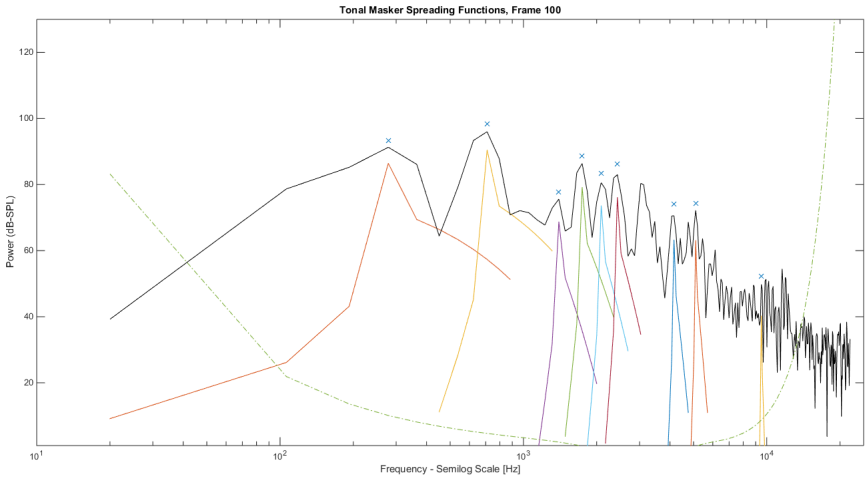
- 1) FFT analysis: include 50% overlap, windowing, and SPL normalization



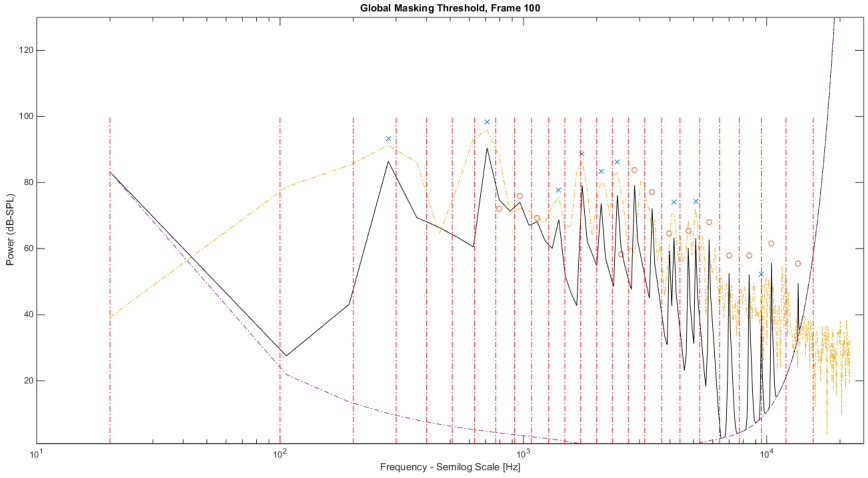
- 2) Identification of tonal and noise maskers
  3) Decimation and re-organizaion of maskers



- 4) Calculation of individual masking thresholds



- 5) Calculation of global masking thresholds



- 6) Bit Allocator/Quantizer @ 384, 256, and 128 kbps

Additional Requirement (Grad student-only OR Undergrad Extra Credit):

- Implement an <u>improvement</u> (e.g., improved tonal/noisy masking determination) **OR** a <u>new stage</u> (e.g., temporal masking) to the Psychoacoustic Ear Model!

Evaluations:

- Compare the Original vs. lowered bit-rates

Presentations are due May 9 at 2:00PM or April 27 at 2:00PM