Design

A step-by-step guide for implementing the wiener filter is as follows:

1. Using "pwelch" with a Hann window of length "nfft" and a "hopSize" hop, estimate S_{YY} and S_{NN}, the power spectral densities of the noisy signal and the noise signal respectively.
2. Compute the transfer function $H(\omega) = 1 - \frac{S_{NN}(\omega)}{S_{YY}(\omega)}$. **Make practical modifications to this transfer function so that it is real-valued and non-negative.** Make sure to set the "freqrange" parameter of "pwelch" to "twosided".
3. Using "ifft", convert the transfer function back to time domain.
4. Use "fftfilt" to perform overlap-add filtering of "y" by the time-domain wiener filter obtained in Step 3.

Result