

Objective:

Currently, only 4x4 Matrices can be inverted on a quantum simulator. To develop a higher order (8th order) Quantum Linear Predictor (QLP) from two lower order QLP's for speech analysis.

Tasks:

- Recently a 4th Order QLP was published [1].
- QLP requires quantum computation of the autocorrelation sequence. The QFT can be used for efficient autocorrelation calculations.
- To design an 8th order QLP we combine a low band and high band 4th order QLP.
- We use the QMF to split into the low band and high band.

Challenges

- Quantum Noise
- Long Processing Time
- Limited Computational Resources

References:

- A. Sharma, G. Uehara, A.Spanias, "Quantum Linear Prediction for System Identification and Spectral Estimation Applications", *IEEE ASILOMAR October 2023*
- A. Sharma, G. Uehara, V. Narayanaswamy, L. Miller and A. Spanias, "Signal Analysis-Synthesis Using the Quantum Fourier Transform," *IEEE ICASSP June 2023*

