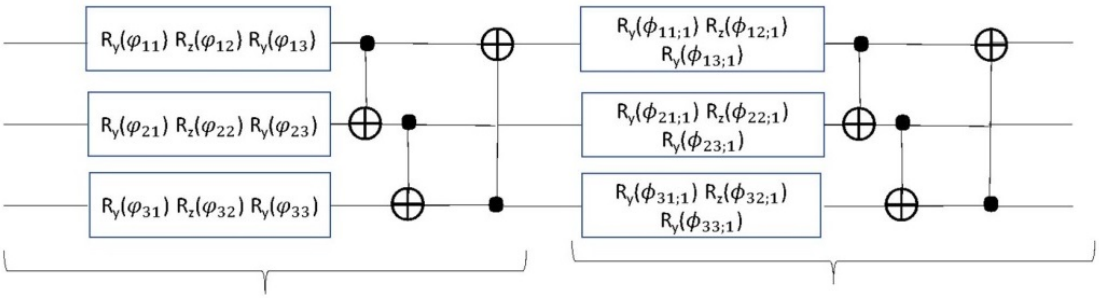
Word filler dataset

Data	Um	Uh	Agree	Music	Laugher	Breath
Number	17079	17526	3775	5060	6623	8288

Difficulties	Limitation	Achievement	Future works
Big audio dataset	Low memory	Analyzing the considered big dataset	Applying random forest method [2]
High dimensional features (16000)	Low computation speed	Applying QNN on data successfully [1]	Changing the structure of network
Input with variable length	Limited time	Changing the size of given input to an arbitrary dimension	Using PCA for reducing the number of features
Noise in data	Inconsistency of different python packages	Changing and analyzing the properties of an audio file	Comparing some classical machine learning method with QNN
Unbalanced dataset	Low accuracy since noise existence and reducing input dimension	Studied about audio properties and its related packages in python	Improving the accuracy by considering more qubits and layers



In case of data-reuploading this combination is repeated n_{layer} times; without data-reuploading only the Variational Layer is repeated

Note: $\phi_{32;1}$= angle of the third qubit in the second rotation gate of the first layer

Reference

[1] Hellstern, Gerhard. "Analysis of a hybrid quantum network for classification tasks." IET Quantum Communication 2, no. 4 (2021): 153-159

[2] Heidari, Hanif, and Gerhard Hellstern. "Early heart disease prediction using hybrid quantum classification." *arXiv preprint arXiv:2208.08882* (2022)