Quantum Artificial Intelligence Predictions Enhancement by Improving Signal Processing

Farina Riaz[1,2], Shahab Abdulla[1], Wei Ni[2], Mohsen Radfar[3], Ravinesh Deo[1], Susan Hopkins[1]

[1]University of Southern Queensland, [2]Commonwealth Scientific and Industrial Research Organization, Australia, [3]La Trobe University

INTRODUCTION

- Quantum Computers have shown exponential computational speed
- Graph Signal Processing can refine the signal by compressing, denoising or extracting useful information
- Graph Neural Network perform feature extraction and classification to perform predictions

Artificial Intelligence (AI) applications are in high demand but with limitations of classical computer processing speed it is difficult to take reliable and timely decisions

METHOD
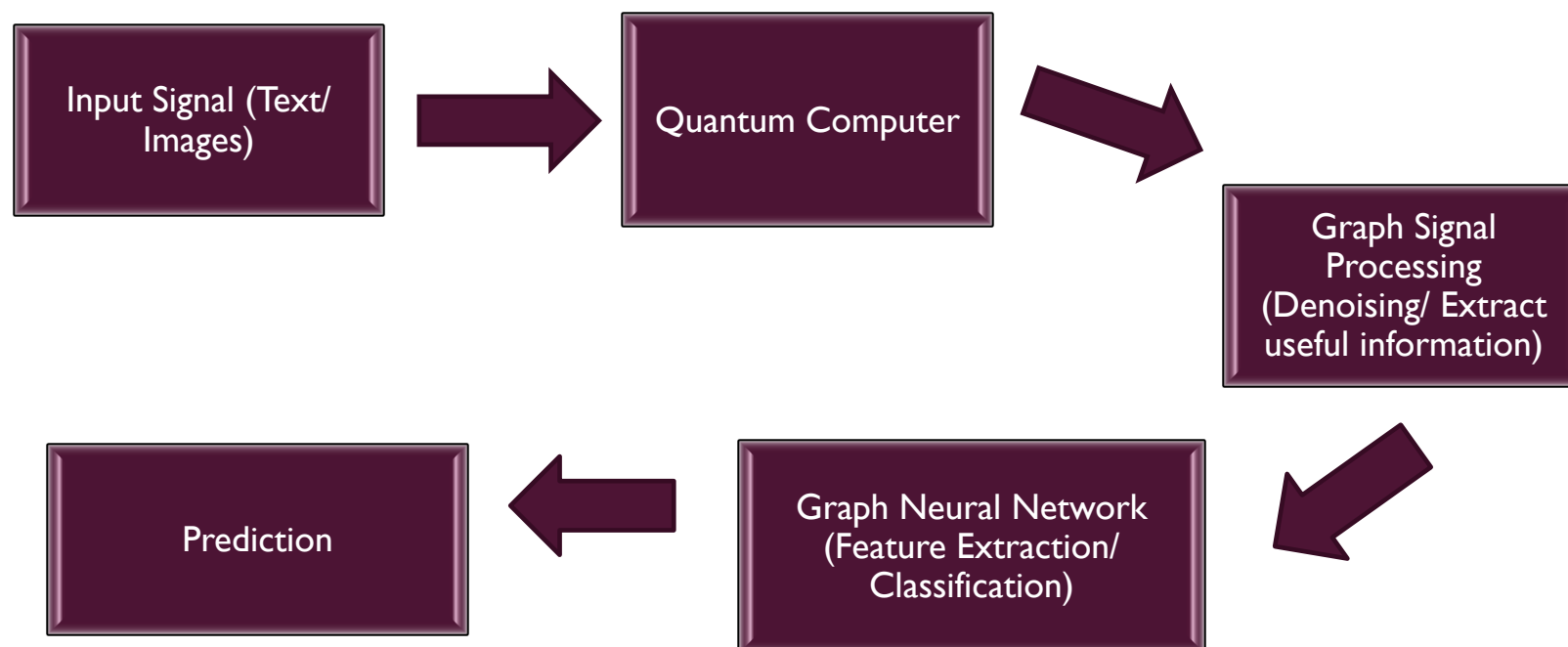
- Input signal will be converted into graph from signals observed. to fed in quantum computer. . The graph signal will be processed for removing noise from the signal and extract useful information. This refined signal will fed into Graph Neural Networks for feature extraction and classification.
- With refined signal, deep learning will require less layers and can perform accurate predictions. Quantum Computer with fast computational efficiency will make this computation in timely manner for real time series data

APPLICATIONS

All Artificial Intelligence applications can get benefit from this research. Whose underlying domain is graph. Few examples are:

Health Sector	Brain MRI's
Social Network	Facebook, Twitter
Weather Prediction	Temperature
Intelligent Transportation System	Traffic Flow

CONCLUSION

This research will impact all AI applications that have graph domains Many AI applications can be designed which are imaginable in current times