**Hybrid Quantum–classical Systems for NISQ Devices with Fast Gates on EEG Classification**

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*Abstract—* *It is not until the advantage of quantum computing devices, the possibility to store more states than either 0 or 1 in one qubits, bring the wide variety of formation processing tasks that the computation power makes breakthrough in the new era of information process. The noisy intermediate-scale quantum (NISQ) devices are defined as the quantum computer for which general-purpose quantum error correction is not feasible and ineradicable hardware errors with two-qubit operations of proper size in the classification problem of EEG signals. Meanwhile, the Gaussian boson sampling (GBS) has demonstrated to be capable of providing a highly-efficient approach to large-scale implementations limiting the fast gates operations. Furthermore, with the Variational Quantum Eigensolver (VQE) equipped, the hybrid algorithms are realized with available circuit depth in quantum phase estimation, optimizing through operation minimization, with the truth that Bayesian variance methods converge faster than the Bayesian inference methods.*

*Index Terms*— *Hybrid Quantum-classical Systems, Gaussian boson sampling, Variational Quantum Eigensolver, rabi fit, fidelity, confusion matrix*

# INTRODUCTION

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# Methodology

## Variational Quantum Eigensolver

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# Conclusions

Use either SI (MKS) or CGS as primary units. (SI units are strongly encouraged.) English units may be used as secondary units (in parentheses). **This applies to papers in data storage.** For example, write “15 Gb/cm2 (100 Gb/in2).” An exception is when English units are used as identifiers in trade, such as “3½ in disk drive.” Avoid combining SI and CGS units, such as current in amperes and magnetic field in oversteps. This often leads to confusion because equations do not balance dimensionally. If you must use mixed units, clearly state the units for each quantity in an equation.

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# Acknowledgements

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Use one space after periods and colons. Hyphenate complex modifiers: “zero-field-cooled magnetization.” Avoid dangling participles, such as, “Using (1), the potential was calculated.” [It is not clear who or what used (1).] Write instead, “The potential was calculated by using (1),” or “Using (1), we calculated the potential.”

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REFERENCES

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1. [↑](#footnote-ref-1)