規格需求書

「量子編排量測分析平台軟體建置」

Software for OPX1000 QIP platform Including dedicated support for AS-QM SW efforts & developments

**規格:**

**Phase 1:**

- Automated 1q Bring-Up on multi-qubit device

- Automated 1q fast Calibration on 10q9c

- Automated 2q Bring-Up on 10q9c

- Automated 2q fast Calibration on 10q9c

- Run GHZ state on 10q9c

- Run repetition code on 9q8c

**Phase 2:**

- Automated 1q+2q Bring-Up on 20q19c

- Automated 1q+2q fast Calibration on 20q19c

- Automated isolated 1q+2q Optimization on 20q19c using XEB

- Automated simultaneous 1q+2q Optimization on 20q19c using XEB

- Benchmarking Quantum Volume on 20q19c

**Phase 3:**

- Run GHZ state on 20q19c

- Run repetition code on 17q16c

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| - Develop error budget modelling & optimization on 20q19c |
| - GH200 integration with 20q19c for various circuits performance evaluation using XEB |
| - Develop Error mitigation techniques  **Phase 4**:  - Develop HPC integration with 20q19c  - Collaborate with local NVIDIA  - Run VQE based Quantum Algorithms  - Run QAOA, QML |

**測試驗收標準:**

**1. 第一期款50%**

Milestone to be achieved: Automated 1q Bring-Up

**2. 第二期款50%**

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| Milestone to be achieved: Run repetition code on 17q16c |
| Measurement: |
| - Automated 1q fast Calibration on 10q9c |
| - Automated 2q Bring-Up on 10q9c |
| - Automated 2q fast Calibration on 10q9c |
| - Run repetition code on 9q8c |
| - Automated 1q+2q Bring-Up on 20q19c |
| - Automated 1q+2q fast Calibration on 20q19c |
| - Automated isolated 1q+2q Optimization on 20q19c using XEB |
| - Automated simultaneous 1q+2q Optimization on 20q19c using XEB |
| - Benchmarking Quantum Volume on 20q19c |